

DECEMBER 24, 1960

Chemical Week

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Long look ahead
finds plastics
leading CPI growth
parade p. 21

Depreciation aid
is virtual certainty.
Now experts ponder
how to do it . . . p. 47

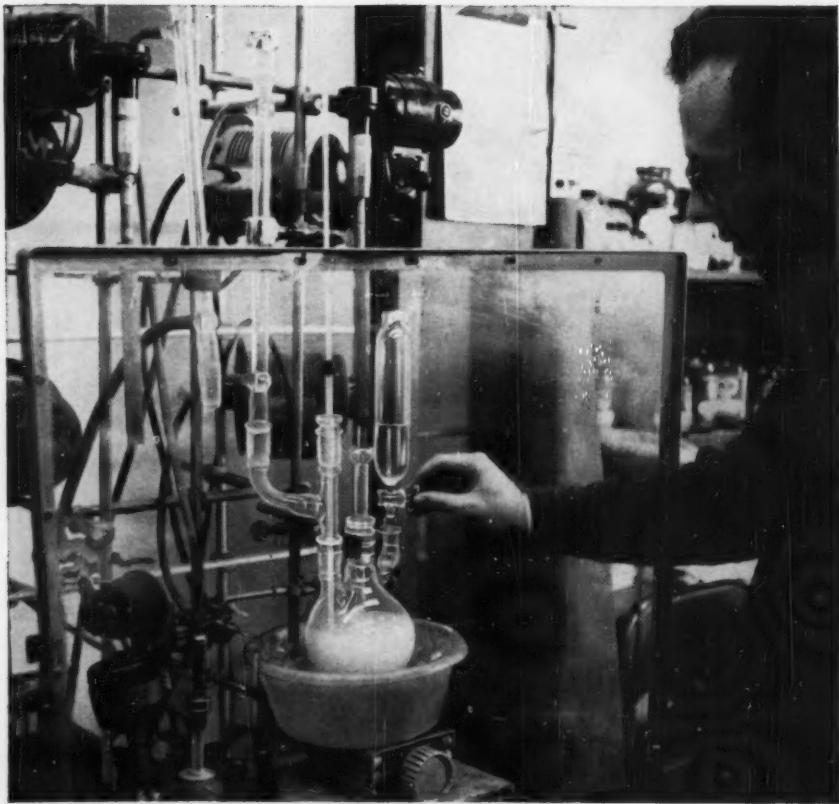
◀ **Perfumers' sweet**
smell of success:
\$134-million sales
this year . . . p. 53

Lessons in statistics
cut R&D costs . . p. 63

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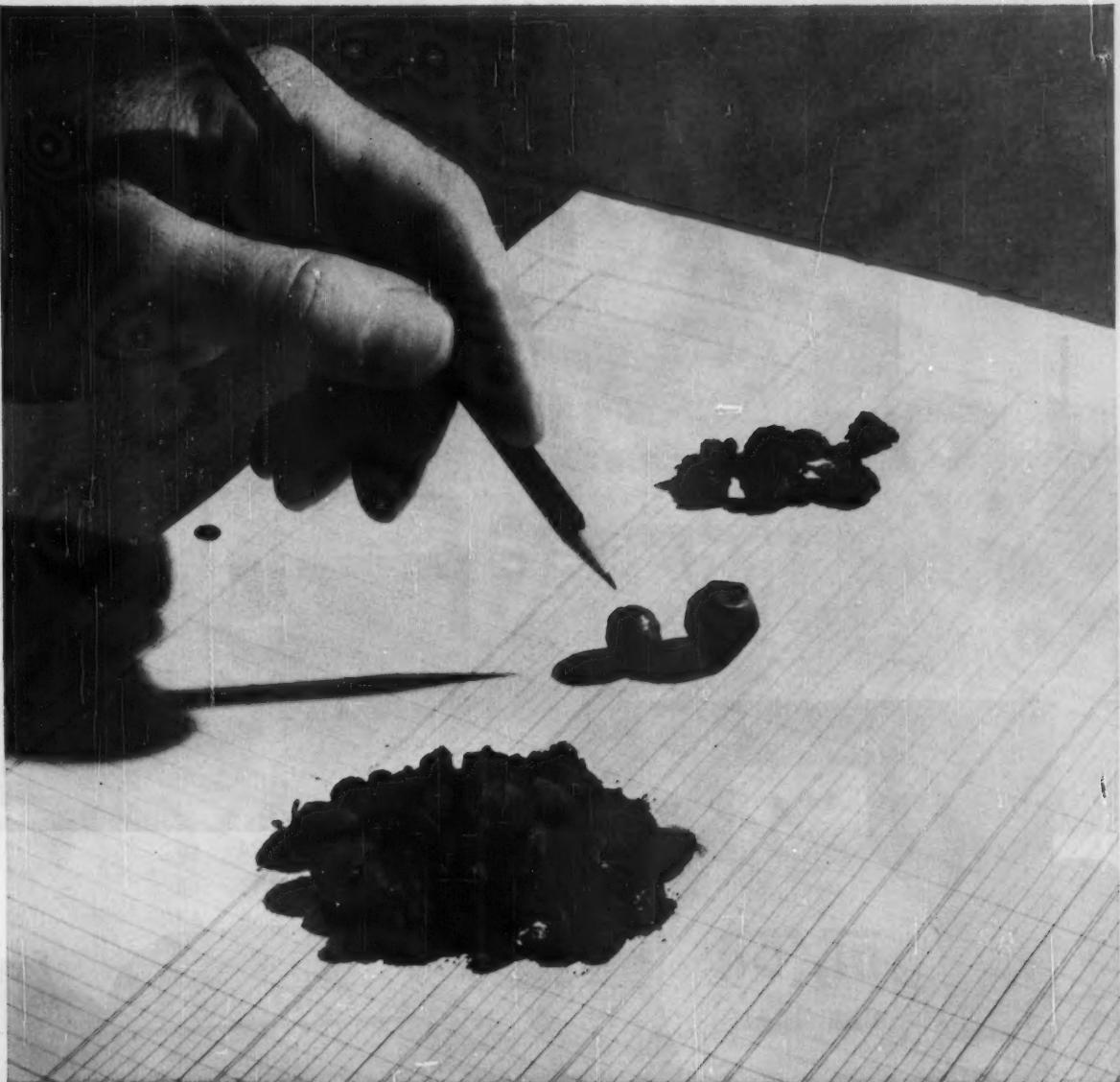
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*Patent No. 2959555



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December 24, 1960 CHEMICAL WEEK 1

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ON THE COVER: In the posh Stag Shop of Saks Fifth Avenue, male gift buyer gets personal guidance on perfume selection. Christmas season fragrance sales will hit \$65 million (p. 53).



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How to Get Good PR

WE WERE STRUCK BY THE UNCOMMON GOOD SENSE of an editorial appearing in a recent Sunday issue of the *Peoria Journal Star*. Entitled "Chemicals—and the Good Life," it said:

Chemicals have been getting a bad reputation with the food-buying public, and that's too bad. Most of the criticism is undeserved, and furthermore chemicals have been doing magnificent work in making this a better world to live in.

The bubonic plague in Europe and the great potato famine in Ireland were caused by pests (fleas and rats). In 1874, grasshoppers caused so great a food shortage here in the Middle West that it was a national emergency. Chemicals have been developed which protect the people and crops against the blights...

... Phenomenal results on the farm developed immediately after the war when DDT became available for civilian use. Crop yields jumped 10 to 20%. Farm production per man-hour rose over 40%—because chemicals were drastically cutting the amount lost by pests.

Or take food processing and packaging. Food now can be transported for thousands of miles and remain in

good condition for months, or years, through the wonder of chemistry...

Chemicals—which nurture crops and livestock, destroy pests, kill weeds, cure and heal, preserve and clean—help assure the people of the United States a nutritional level as high as any in the world—and what's more they make food cheap enough that we all can enjoy any kind we want.

It is regrettable that chemicals are getting a questionable reputation. They are not new—man long put salt on his meat to preserve it, and through centuries other methods of chemical food preservation were used. But now that we've had breakthroughs in science which produce amazing results in more and better food for the average American than ever before, people are suspicious of the horn of plenty. These suspicions must be cast aside by the general public before scientists can advance much farther—for science can never be too far ahead of the people.

We wired the newspaper to find out what prompted the editorial, what the sources of information were. Bill Little, the *Journal Star's* editorial writer, replied that he had attended the Kansas State University Science Writers' Conference Nov. 14-18 on a National Science Foundation grant.

"I was tremendously impressed with the conference," he wrote. "We got science thrown at us from morning until around midnight every day. We met, listened to and lived with scientists of the first caliber.

"Not being a science writer, I was particularly taken with the advances made by science which the public doesn't know about. I saw a problem: Science can get only so far ahead of the general public, and when it goes beyond that point the public will hold it up. . . . To the average man, chemicals on foods are bad. Hence, legislation ensues which hampers developments in this field. In essence, the public has held back science"

Bill Little is fighting for reason, but for him and for all others on his side—like us—the battle isn't easy. In a "Letter to the Editor" of the *Journal Star* a few days later, a female reader cites the increase in cancer, mental deficiency and illness, heart disease, obesity and allergies, and asks: "Why has the U.S. fallen heir to all these and many other diseases? The number of these and so many other chronic ailments has climbed steadily along with the scientific progress in food chemistry."

The battle for reason isn't easy, but neither is victory impossible. This is the time of year for resolutions, so let us suggest one for chemical makers and users: emulate the National Science Foundation by enabling the Bill Littles throughout the nation to learn the truth about chemicals. Make sure, moreover, that they get the truth and not self-serving propaganda: editorial writers are paid to be skeptical. The truth is great, and shall prevail.



why chemical companies are taking a closer look at
DELHI-TAYLOR

Chemical companies are taking a closer look at Delhi-Taylor as a source for their raw materials. The reason? Flexibility and dependability of Delhi service. Here are just a few examples:

- Delhi can move quickly into production on-new petrochemicals. Our recent Orthoxylene plant, engineered by our own staff, was in production in 6 short months.
- Our selected feed stocks and diversified petroleum streams offer an unlimited source of chemicals.
- The location of our plants on the Inland and Coastal Waterways with multiple docking facilities means low cost, fast deliveries.

- Strategically located petrochemical terminals add to our delivery advantages.
- Rigid quality control and testing procedures assure highest purity products.
- Our experienced technical service department can assist you in planning your products.

Delhi is at your service. Now in production on a wide range of aromatic chemicals and aliphatic solvents, our plant facilities are geared to move quickly in new chemical directions.



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LETTERS

Up & Down or Across?

TO THE EDITOR: I have read with interest your excellent article comparing Union Carbide, Dow and Du Pont (Nov. 12, p. 87).

I would like to suggest to your graphics department that correlation diagrams such as those you show (p. 96) become somewhat easier to interpret if the dependent variables (in this case the individual company figures) are plotted on the vertical scale and the independent variables (in this case the GNP & FRB statistics) are plotted on the horizontal scale.

When so plotted the steeper the slope of the line, the faster the company sales growth per increment of increase in the independent variable. This is in keeping with our normal concept of a steeper slope indicating a greater increase when looking at a graph.

I am a regular reader of your publication and enjoy it thoroughly.

H. R. MACKENZIE
Secretary & Treasurer
Syntex Corp.
Mexico, D. F.

Solid vs. Liquid

TO THE EDITOR: . . . Your story (Oct. 22, p. 40) mentions that the Navy and the Air Force have become disenchanted with solid-type rockets for small air-launched missiles.

We wish to draw your attention to the performance record of the Falcon family of missiles, an Air Force air-to-air missile system, the solid rocket engines for which were developed by (and many thousands produced by) Thiokol Chemical Corp. This system, which has been operational since '54, has the most enviable record of 99.8% reliability in flight, and its propellants have been qualified in environments as low as -75 F and as high as +200 F for service operational firing from -65 F to +190 F.

Your comment on the cracking of solid-rocket engines in the field was possibly based on the propellant crystallization phenomenon recently experienced by several solid-propellant manufacturers. This phenomenon, which covers severe degradation of propellant physical properties at low temperatures, creates the conditions described in your article. Thiokol was

perhaps "fortunate" to encounter and solve this problem several years ago. No cracking problem now exists, as shown by the results described above.

BRYCE WILHITE
Director of Technical Operations
Thiokol Chemical Corp.
Rocket Operations Center
Ogden, Utah

MEETINGS

American Assn. for the Advancement of Science, annual meeting, Philadelphia, Dec. 26-31.

American Chemical Society, 27th annual chemical engineering symposium of the division of industrial and engineering chemistry, Washington University, St. Louis, Mo., Dec. 29-30.

Instrument Society of America, winter instrument-automation conference and exhibit, Sheraton Jefferson Hotel and Kiel Auditorium, St. Louis, Jan. 17-19.

Society of Plastics Engineers, annual technical meeting, Shoreham and Park Sheraton hotels, Washington, D.C., Jan. 24-27.

Soap industry convention (soap, detergents, glycerin, fatty acids), Waldorf Astoria Hotel, New York City, Jan. 25-27.

American Chemical Society southeastern Texas section, fourth biennial symposium on hydrocarbon chemistry, Shamrock Hilton Hotel, Houston, Jan. 26-27.

Plant maintenance and engineering show, International Amphitheatre, Chicago, Jan. 30-Feb. 2.

American Society for Testing Materials, committee week. Topic: symposium on fire tests methods (Feb. 1), Netherlands Hilton Hotel, Cincinnati, Jan. 30-Feb. 3.

National Assn. of Purchasing Agents, midwinter conference, Hotel Commodore, New York City, Feb. 1-2.

Industrial management and engineering conference, Illinois Institute of Technology, Chicago, Feb. 2-3.

Society of the Plastics Industry, reinforced-plastics division conference, Edgewater Beach Hotel, Chicago, Feb. 7-9.

Pharmaceutical Manufacturers Assn., annual midwinter conference, Ambassador Hotel, Los Angeles, Feb. 20-21.

Technical Assn. of the Pulp and Paper Industry, annual meeting, Hotel Commodore, New York City, Feb. 20-23.

Petrochemical and Refining Exposition (first in U.S.), sponsored by American Institute of Chemical Engineers, Municipal Auditorium, New Orleans, Feb. 26-March 1.

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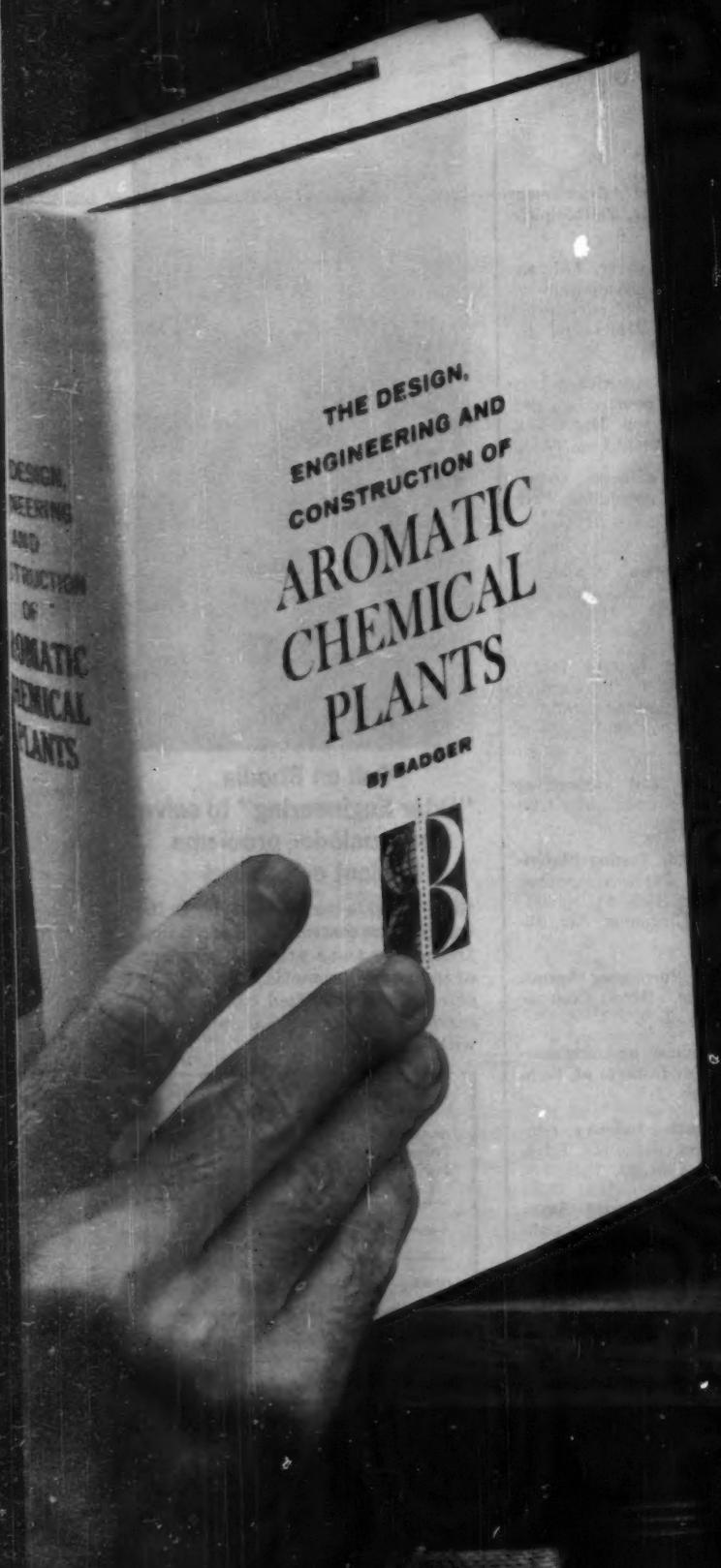
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When you are considering new facilities for the production of any aromatic, talk first to the people who have made a habit of success in the field. Ask the Badger man for the full story — write, wire or phone today.

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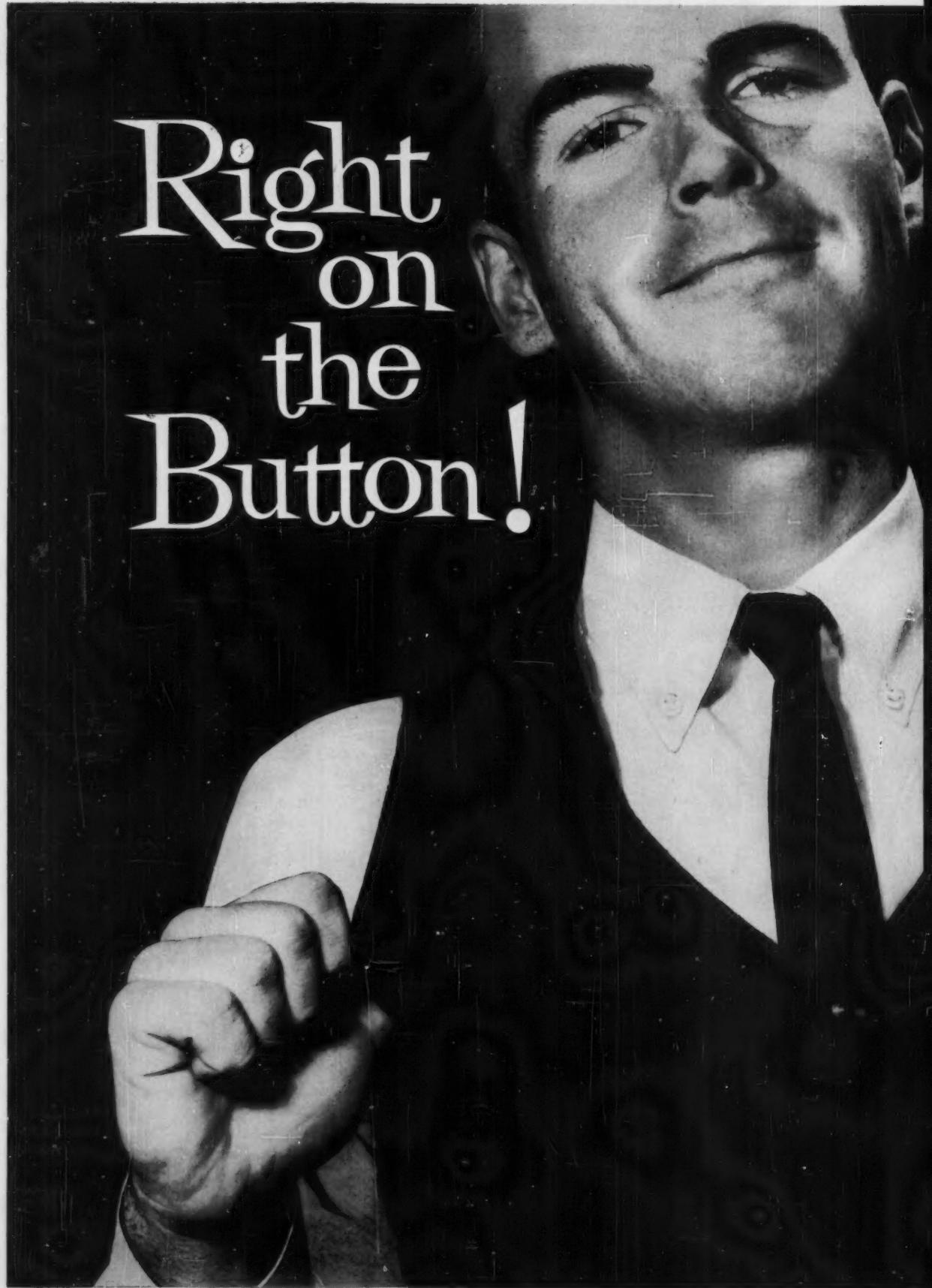
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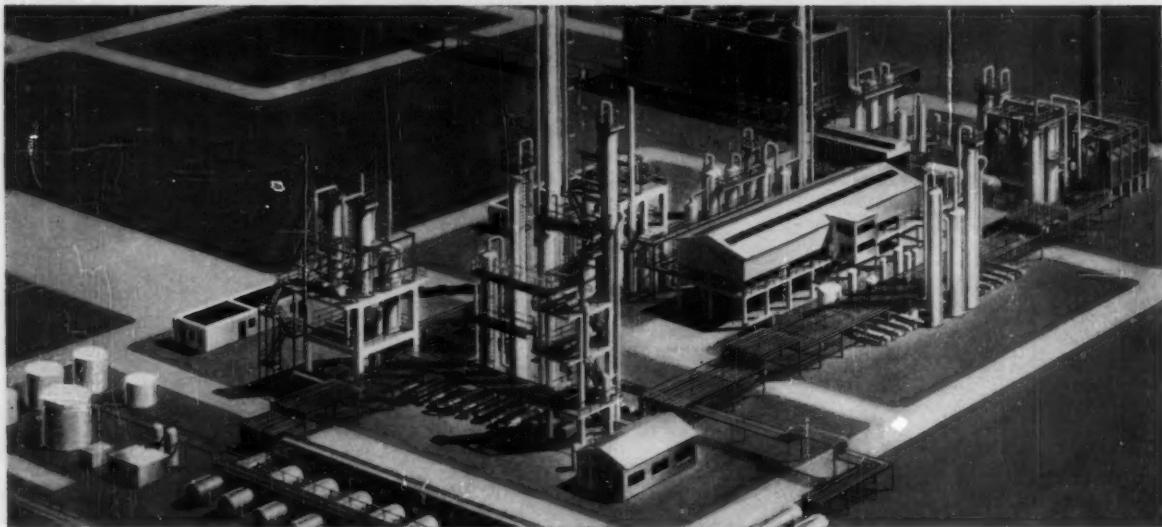




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New \$20 million Ethylene and Ethylene Oxide plant to go on stream for SunOlin in 1961

FACILITIES WILL PRODUCE 225,000,000 LBS. OF ETHYLENE
AND 55,000,000 LBS. OF ETHYLENE OXIDE PER YEAR



The Lummus Company has been awarded the contract to design, engineer and construct a \$20 million ethylene and ethylene oxide plant for SunOlin Chemical Company at Claymont, Delaware.

The plant is scheduled to go on stream late in 1961, and will have a design capacity of 225,000,000 lbs. of ethylene and 55,000,000 lbs. of ethylene oxide per year. Existing facilities will be modified to permit production of 12,000,000 cubic feet of high-purity hydrogen and up to 1,000,000 cubic feet of carbon monoxide per day.

The new units will be located at Claymont, Delaware, adjacent to the Sun Oil Company's Marcus Hook Refinery which will supply the raw material for the plant.

A substantial portion of the products produced will be used to supply the requirements of major chemical companies in the area. To permit efficient delivery of ethylene and other petrochemicals, a multiple pipe line crossing will be laid under the Delaware River from the site to serve customers in the expanding Southern New Jersey industrial area.

The remainder of the production will be used in the manufacture of products marketed through existing sales outlets

of Sun Oil Company and Olin Mathieson Chemical Corporation, the joint owners of SunOlin.

The plant will employ Lummus' low-temperature ethylene separation process, which provides high separation efficiencies and unusual flexibility and reliability; and Shell Development Company's ethylene oxide process, which offers the advantages of unusually high yields and virtual elimination of waste disposal problems encountered in the classic Chlorohydrin Process.

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AEROSOL 22

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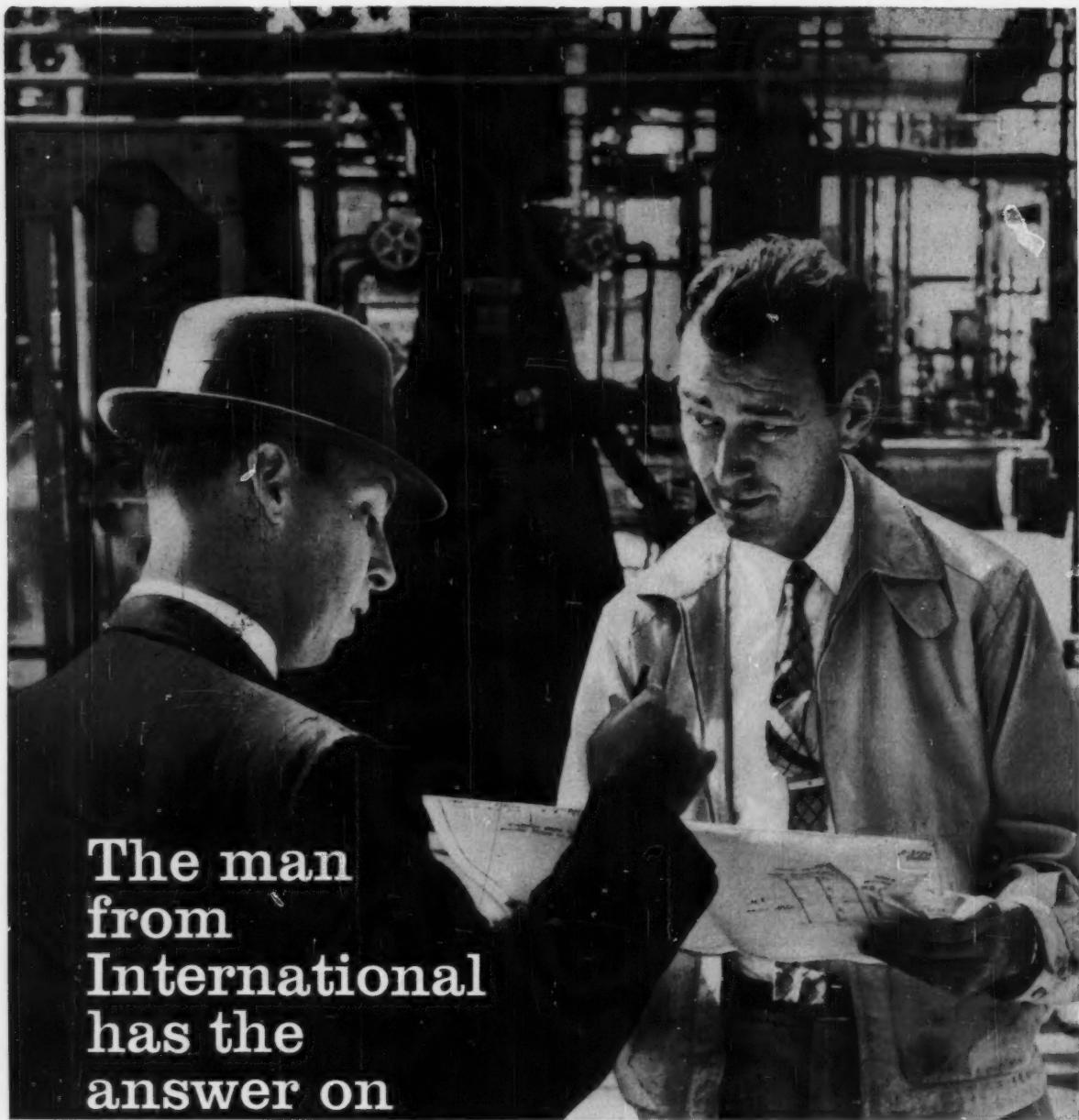
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*Reg. T.M. of the International Salt Company.

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Business Newsletter

CHEMICAL WEEK
December 24, 1960

Two companies are upping their investments in sidelines.

Dow Chemical has decided to take up its option to buy the Sheet Aluminum Corp. plant at Jackson, Mich.—the only aluminum sheet rolling mill in Michigan. Dow also is modernizing its aluminum mill at Madison, Ill., "for mass production of a broad range of semifabricated aluminum, magnesium and other metal mill products," and recently hired additional specialists in this line "to place more emphasis on aluminum and other metals."

And Ashland Oil & Refining is growing in petrochemicals. In another year or two, management says, "our investment in the field of petrochemicals should be almost as large as our total depreciated investment in conventional oil refining." Although total company sales and earnings in the fiscal year that ended Sept. 30 were less than in the '57 peak, sales of petrochemicals were higher than ever.

And two other companies are spinning off surplus plants.

International Salt Co. is closing its Ludlowville refinery at Ithaca, N.Y., after 56 years of operation. The Ludlowville plant's Monel vacuum pans will be "launched" in Cayuga Lake and floated to International's Watkins Glen, N. Y. refinery. The consolidation of production is an economy move.

Spencer Kellogg is selling its Chicago vegetable oil refinery to a local investment group and its California cotton gins to Producers Cotton Oil Co. (Fresno, Calif.). The company plans to sell its Long Beach, Calif., plant for crushing flaxseed, cotton seed and copra. Reasons add up to unsatisfactory profitability. The company expects to save up to \$600,000/year by dropping these operations, expects to realize \$2-2.5 million on the sales. Proceeds will be spent for acquisitions in "profitable fields"—not necessarily in Spencer Kellogg's traditional business.

Witco Chemical is expanding in petroleum specialties by purchasing Continental Oil Co.'s plant at Gretna, La., which produces white mineral oils and petrolatums. Last summer Witco acquired a major producer of such products—Sonneborn Chemical and Refining Corp. (CW, Aug. 13, p. 25).

The Gretna plant—Witco's fifth acquisition in the past two years—could put the company over the \$100-million sales mark this year. The company's consolidated nine-month figures—not previously available because of complications in converting Sonneborn accounts to Witco's fiscal-year basis—showed earnings up 4.8%, to \$2.5 million, on sales that were up 4%, to \$74.6 million.

Selling the Gretna plant puts Conoco out of the white oils and petrolatum business—but this was only a small part of Conoco's petro-

Business Newsletter

(Continued)

chemical program. Conoco is still expanding in petrochemicals, has just started up a new cyclohexane plant (see *Market Newsletter*, p. 69) and is building a unit at Lake Charles, La., to produce straight-chain alcohols (*CW Business Newsletter*, Aug. 29, '59).

Oil industry wages—a prime factor in petrochemical wage negotiations—now seem certain to rise somewhat less than 5% in '61. That's the outlook this week as various locals of the Oil, Chemical & Atomic Workers Union (AFL-CIO) started voting on ratification of Sinclair's offer of a 14¢/hour across-the-board pay rise. OCAW's bargaining policy committee approved this offer as "the best we could do under present circumstances." Likely significance: the union is giving up its demand for an 18¢/hour general wage increase (*CW*, Dec. 17, p. 28). OCAW President O. A. Knight says he is "confident that similar wage increases will spread throughout the industry to unorganized as well as organized workers." The Sinclair offer would be on the customary open-end basis —i.e., new wage negotiations could be requested at any time.

Major changes in U.S. economic relations with Europe may eventually result from the formation last week of the Organization for Economic Cooperation and Development (see p. 25). U.S. membership in the 20-nation group will not, however, involve any new commitments in trade regulation.

While the organization it replaces—the Organization for European Economic Cooperation—was deeply involved in European trade problems, OECD leaves this area to the General Agreement on Tariffs and Trade organization. OECD will deal with such problems as the European trade bloc split, coordinating members' economic policies, aiding underdeveloped countries. And it will continue OEEC's role of developing nuclear energy on an Atlantic Community scale, with or without U.S. participation. OECD decisions must be by unanimous vote. Little opposition to U.S. participation is expected in Congress.

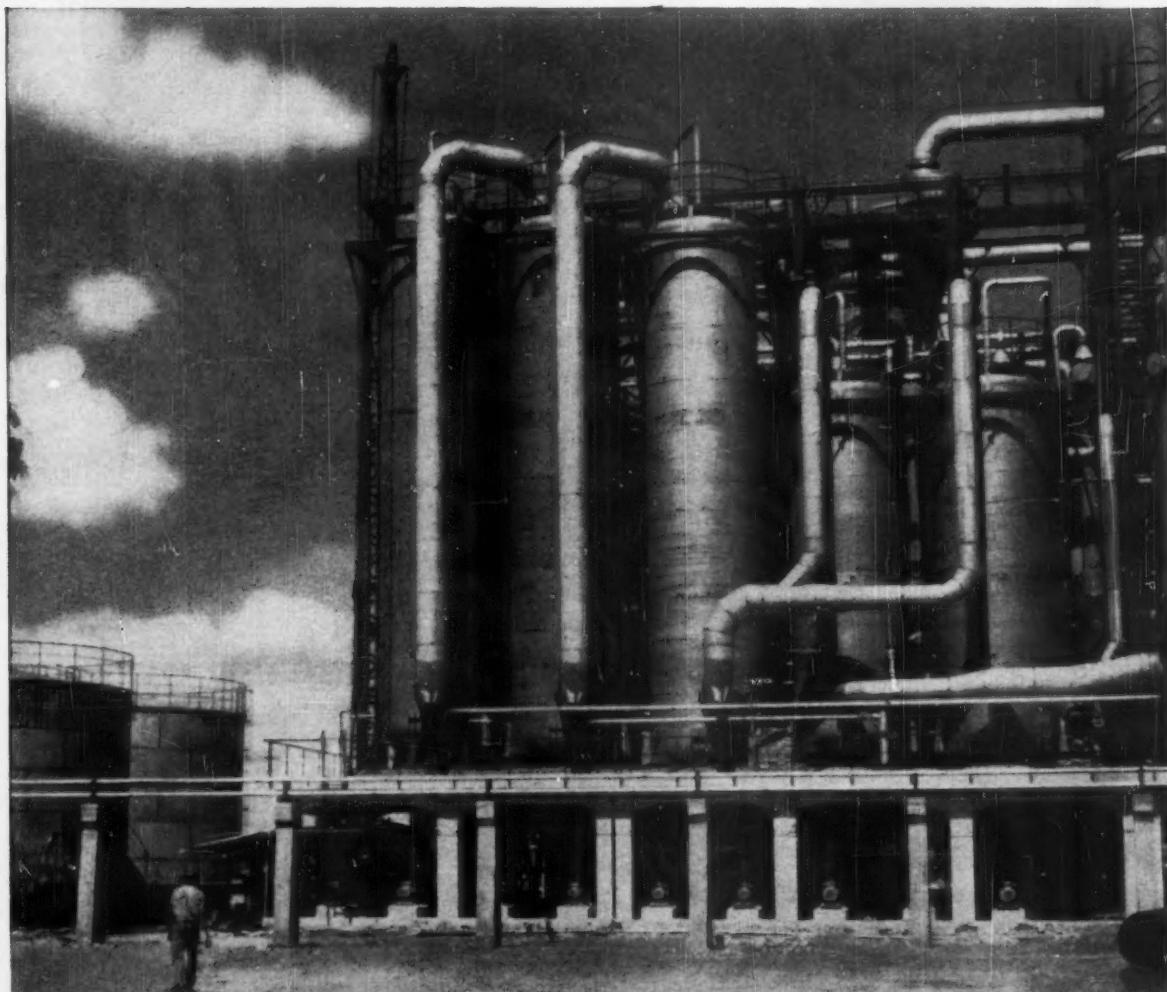
Turkey hopes to attract foreign investors by amending its foreign investment law. A new bill would, in effect, grant foreign investors complete freedom in importing raw materials and components and in remitting profits.

Texaco's '61 capital spending for petrochemicals will amount to "between \$30 million and \$75 million" out of total anticipated capital expenditures of about \$500 million (see also p. 22). Board Chairman Augustus C. Long says there is no question but that Texaco "will invest quite heavily in petrochemicals in the next few years." Much of this construction program is to be in the foreign field, and the products will mainly be "basic building-block chemicals." Long adds that "wherever possible, our investments will be in wholly owned projects, as we lean more and more toward that type of operation."

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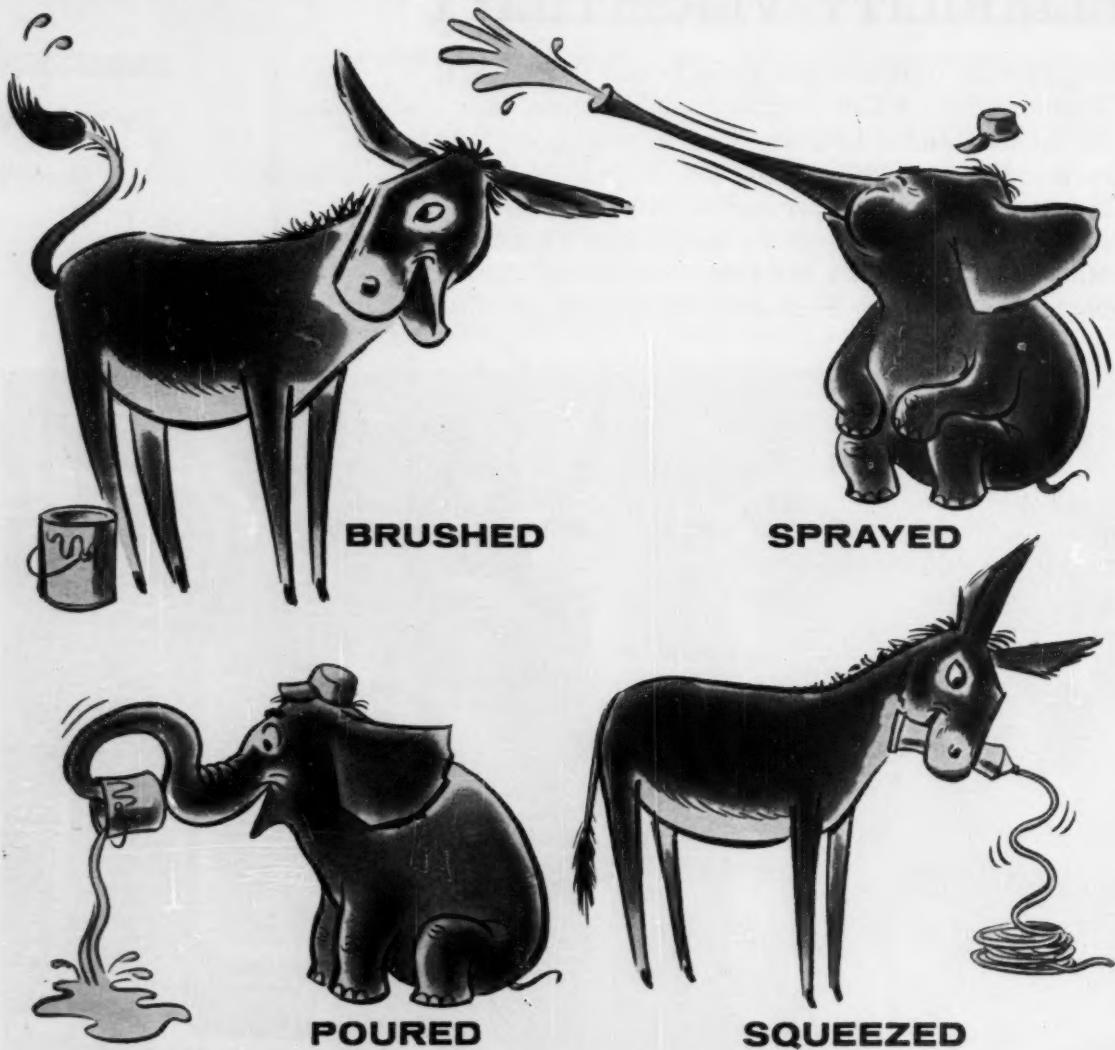
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BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

Chemical Week

December 24, 1960

Where Will We Be 15 Years from Now?

Plastics—making rapid headway in the growing market for materials of construction—will set the pace among U.S. industries for growth in physical output and sales during the next 15 years. Only modest gains are likely in the year just ahead (see p. 31). But U.S. business will enjoy vigorous growth during the '61-'75 period as a whole—despite possible ups and downs along the way.

The long-range trend is outlined this week by the McGraw-Hill Dept. of Economics. A 15-year outlook study—based on experts' appraisals of present and foreseeable business forces—clearly reveals two key factors:

(1) The substantial growth potential of the U.S. economy as a whole—with Gross National Product expected to increase 87%, compared with a rise of only about 55% over the 15 years ending next week.

(2) The extraordinary potentials for growth of a number of individual industries—notably, the anticipated 300% increase in production and sales of synthetic resins.

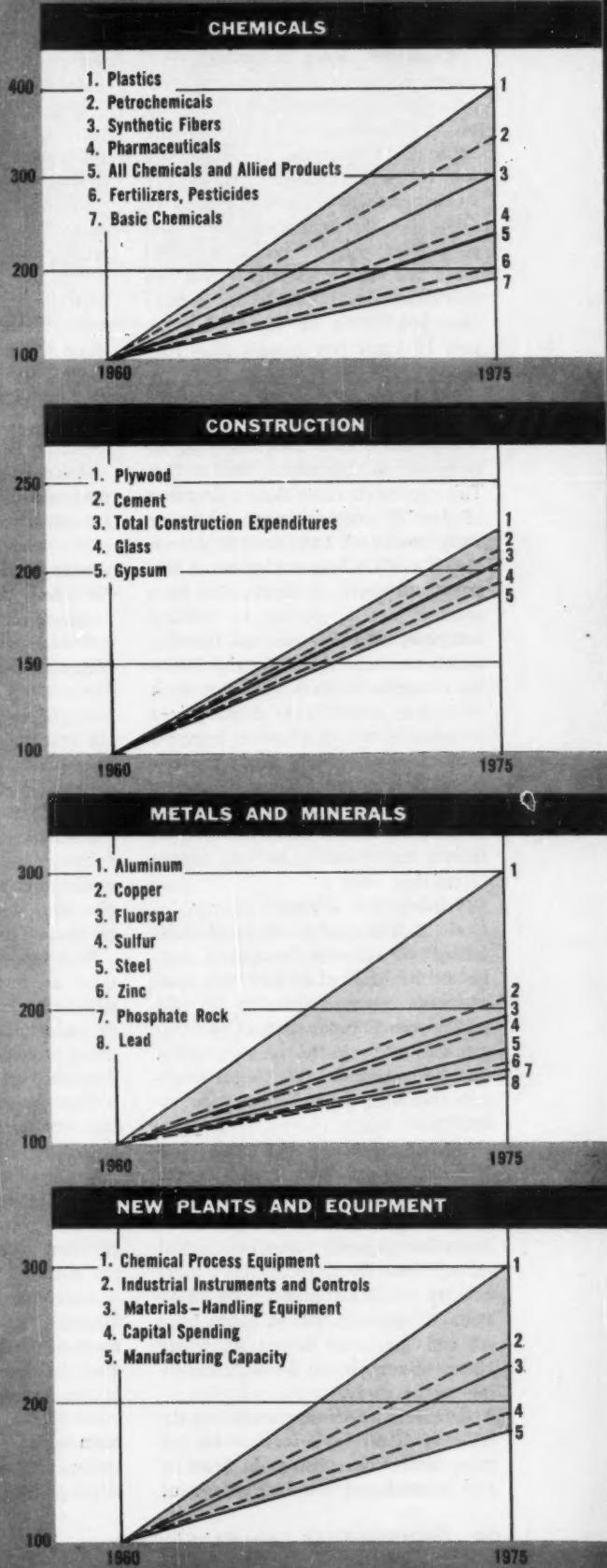
Growth Geared to Research: Main reason for predicting a speedup in U.S. economic growth during the next 15 years is that "America's growth is linked directly to research and development"; and research and technological developments—supported by expenditures rising from nearly \$13 billion this year to \$23 billion by '70—"are moving forward at a rapid pace." While GNP climbs nearly 90% (from an estimated \$503 billion in '60 to possibly \$940 billion in '75), "many industries will more than double in size in the next decade and a half."

Dollar volume of R&D work carried out by industry more than doubled in the past six years—from less than \$4.8 billion in '55 to \$9.6 billion this year; and outlays for R&D work performed by government, universities and foundations adds up to \$3 billion in '60. These expenditures include even more steeply rising allocations for basic research—up sixfold from '45 to \$1 billion this year and expected to amount to more than \$3 billion in '70.

Result of all this R&D work, the survey report continues, has been creation of new products and new industries. "For example, in the past decade output of plastics is up 300%, electronics production is up 240%, aluminum output has increased 200%. Even companies in such well-established fields as food

Trendlines for CPI Growth

(Index: 1960 = 100)



processing have close to 30% of present sales in product lines developed since '50."

Chemicals Keep Climbing: Producers of chemicals and allied products—relying heavily on R&D for new products and improved processes—are expected to maintain a growth rate well above the national average. The survey projects a 15-year growth of 140% for this industrial group; and at current price levels, this would mean that sales would climb from this year's anticipated \$27.8 billion to more than \$66 billion in '75. During the past 15 years this group's sales rose about 175%.

Within the CPI, output of synthetic resins is projected to shoot up from nearly 6.5 billion lbs. this year to as much as 25 billion lbs. in '75. This represents more than a doubling of the '75 potential since a similar study based on '57 trends (*CW, March 8, '58, p. 35*). Biggest element in this predicted growth is expected to be a spurt in use of plastics as building materials; and this—as an industry spokesman told the Industrial Building Congress in New York last week—"is due primarily to a recognized acceptance of their often superior characteristics." Many instances can be cited, declared William Demarest of the Manufacturing Chemists' Assn., in which plastics have far outperformed costly metals such as copper or stainless steel.

Tripling for Fibers: Output of synthetic fibers—expected to continue taking over more of the apparel market in the form of blends with wool and cotton—may triple by '75, the survey shows. Production of pharmaceuticals is projected to rise 150%, and the market for agricultural chemicals (including fertilizers) may double by '75.

"Most industrial chemicals will track along with the general growth in industrial production, but the sharpest growth within this group will be synthetic organic chemicals. And among these the petrochemicals stand out. By '75 about three-fourths of all synthetic organics will be made from oil and gas; and output of petrochemicals may be up 240%," according to the study.

Relatively moderate growth—on the order of 50-60%—is forecast for the older nonferrous metals. A threefold rise is predicted for U.S. usage of

aluminum; but this represents a considerably slower growth rate than was foreseen for this metal in the '57 survey. Biggest outlets: buildings, autos and boats.

Output of titanium is expected to increase several fold, and magnesium production "may increase 300%" during the next 15 years.

Authors of the study caution that there is nothing automatic about attaining these growth potentials. "Fail to do short-range planning successfully," they emphasize, "can remove a company from the ranks of those which may develop the longer-range potentials."

Buying into Beryllium

Anaconda Co. (New York) last week moved a step closer to playing an active part in the beryllium race (*CW, Nov. 26, p. 39*) by optioning a sizable number of beryllium claims in Nevada.

Anaconda's two-year option is for 103 claims (20 acres/claim) in the Mount Washington mining district of Nevada, 40 miles southeast of Ely, Nev. In taking this step it became the first major U.S. mining company to acquire a raw-materials stake in the expanding probe for domestic beryllium.

Industry sources predict that if development work turns out well, Anaconda will build an integrated complex for mining, concentrating and producing the metal and its oxides.

This broad-scale venture would require an investment of at least \$10 million and would place Anaconda in competition with existing beryllium metal producers Brush Beryllium and Beryllium Corp.

The optioned properties—containing beryllium mineralization of the phenakite and bertrandite types—have beryllium reserves described as "large" by the U.S. Geological Survey last month. The area has been explored previously for tungsten, lead and zinc.

Anaconda had previously acquired interests in 16 claims immediately north of the larger claim block. While work in developing the ore reserves in the underground mine will begin immediately, Anaconda officials remain quiet on both details of the option-purchase contract and its long-range plans.

Petrochemical Drive

Steadily gathering momentum this week is the drive by oil, gas and pipeline companies to utilize more and more of their hydrocarbons—especially LPG materials—in petrochemical production (*CW Business Newsletter, Dec. 10*).

Tennessee Gas Transmission Co. (Houston) has set up Tenneco Corp. as a subsidiary to own and operate all of TGT's nonregulated activities—particularly production, refining and marketing of oil and petrochemicals. It will also take over TGT's real estate interests, including the big tract of land along the Houston Ship Channel. And TGT has just designated Harry O'Connell as project development manager assigned to planning "for expansion and diversification in the field of hydrocarbon utilization and petrochemicals."

TGT's Tennessee Oil Refining Co. division has awarded contracts to Bechtel Corp. and Badger Mfg. Co. for the aromatics plants to be added to its refinery at Chalmette, La. Capacity of these new units: benzene, toluene and xylenes, 2,200 bbls./day; ortho-xylene, 22 million lbs./year; ethylbenzene, 20 million lbs./year.

And TGT has applied for government approval of the proposed pipeline that would bring natural gas from the Texas Gulf Coast and northern Mexico into the Los Angeles area. Humble Oil & Refining Co.—which would supply most of the dry natural gas for this 1,592-mile pipeline—would first strip out the natural gas liquids; the liquids would then be available both for captive use and for sale to other users.

Sun Oil Co. (Philadelphia) is planning a gas separation plant with connections to existing facilities in the Marcus Hook, Pa., area. This \$9.3-million project would have daily capacity to separate 14.4 million cu.ft. of dry gas, 7,100 bbls. of liquefied propane and propylene, 13,200 bbls. of liquefied butane, and 18,000 bbls. of gasoline. Some of the output will go to Sun's propylene splitter.

Tidewater Oil Co. (Los Angeles) and Texaco Inc. (New York) are both mapping petrochemical expansions. Tidewater says refining and petrochemical projects will get 40% of the \$111 million budgeted for '61 capital investments; its construction

program includes naphthalene plants in California and Delaware. Texaco says it's "actively considering additional investments in petrochemicals in the foreign field," but is not ready to give further details. Texaco recently completed a cumene plant in New Jersey and is now launching benzene-from-petroleum projects in Texas and Ontario.

Two pipeline companies are making financial arrangements that are likely to lead to increased availability of LPG materials. Houston Corp. (Houston) has deferred '61 and '62 payments on pipeline bonds and has rescheduled the maturity date of a bank loan from Dec. '61 to Jan. '64. It's hoping to build an LPG separation plant in Florida as a joint venture with Sun Oil. Pacific Gas Transmission Co. (San Francisco) is planning a \$13.3-million issue of convertible debentures to help finance a 614-mile natural gas pipeline from the Canada-Idaho border to the Oregon-California border. Natural gas liquids would probably be separated from the dry gas in Canada.

Mid-America Pipeline Co. (Tulsa, Okla.) says its 2,200-mile LPG pipeline from Texas and New Mexico to Minnesota and Wisconsin is nearly complete. A Minnesota consumer—Minneapolis Gas Co.—has just awarded a contract to Chicago Bridge & Iron Co. for a 120,000-bbls. propane storage tank, said to be the world's largest.

Wooing via Know-how

Pan American Sulphur Co. (Houston, Tex.) is building a miniature contact unit to obtain technical data on sulfuric production. Object: to win favor of sulfuric acid producers, who are the biggest buyers of sulfur.

The plant—a Monsanto-Leonard contact unit with capacity of 15 metric tons/day (about 6,000 short tons/year) of 100% sulfuric acid—is designed to duplicate typical commercial practice. It is being equipped in such a way "that a maximum amount of operating information can be obtained and so that transient upset conditions can be duplicated and measured." It will be situated at Pan Am's mine in Jaltipan, Veracruz, Mex.

Periodic progress and correlation reports are planned, and a problem forum is seen as a probable outgrowth of the program.



U.S. Rubber's Vila, Goodyear's Thomas, General's O'Neil: Their legal contest will determine worth of recently granted oil-extended rubber patent.

New Patent Triggers a Fight

A long-standing process in synthetic rubber tire manufacturing is due for stormy legal action. General Tire and Rubber Co. (Akron, O.) last week received a patent on high-Mooney oil-extended rubber for use in tire treads. General Tire President M. G. O'Neil immediately sent letters to 18 companies in the field, offering licenses. President George Vila of U.S. Rubber and Chairman Edwin Thomas of Goodyear received with their letters a notice that they are being sued for patent infringement.

General is asking $\frac{3}{4}$ ¢/lb. royalty for oil-extended synthetic used on tire treads (the patent does not cover other uses of oil-extended rubber). An initial license fee of \$2,000 will be charged. If royalties are collected from all users of the rubber for tire treads, payments could amount to \$3.9 million/year.

Battle Is Brewing: Indications are that General has far from won its battle—which has already lasted 10 years. General gained its patent after persuading a U.S. district court to reverse a Patent Office decision against granting a patent to anyone.

The company first filed for a patent in '50 and this application was rejected. Later, General says, information about its process leaked to the industry, partly through the government, which—as the controller of the U.S. synthetic rubber industry—had been approached about buying the process. General claims that subsequent industry research on oil-extending was based on these disclosures.

Interested rubber companies helped gather witnesses and documents to oppose General's patent plea. Parties in-

volved say much of the material has not yet been presented, and more has been gathered since.

Privately, many people in the rubber industry feel that the patent won't hold up under pressure of the infringement suits. Nobody is rushing for a license.

Solid Opposition Likely: Since the initial infringement suits are against U.S. Rubber and Goodyear—two of the industry's "Big Three"—General apparently expects concerted industry opposition (as it has had so far). Otherwise it would be more normal (and easier) to try to make a case of that kind stick against smaller companies, thus establishing legal precedent.

The U.S. Dept. of Justice has followed General's patent situation closely. It first feared that the government would be liable for damages, having sold the plants to industry. General's restriction of its claim to tire treads, however, relieved this fear. Patents that were pooled during the years of government ownership involved the chemical processes, rather than such end-uses, which are functions of tire makers rather than synthetic rubber manufacturers.

But the Justice Dept. is still concerned—in its role as guardian of competition in the synthetic rubber industry. Says the department in its latest annual report on the industry: "At best, this litigation will introduce considerable uncertainty in the marketing of oil-extended rubber. At worst, the royalties General may be able to levy on the rubber industry . . . may give it a decided competitive advantage over other synthetic rubber producers."

INTERNATIONAL

Crises in Laos

U.S. hopes for maintaining pro-Western feelings in most of southeast Asia have been dimmed by the battle raging last week for control of Vientiane, administrative capital of the tiny kingdom of Laos.

The final outcome of the war in Laos could be a critical factor in the Western world's ultimate position in all of Asia. And last week the confusing battling in Laos was cut down to its bare significance—a war between the U.S. and communism. On one side are the pro-U.S. forces of General Phoumi Nosavan. On the other is Capt. Kong Le, who has integrated his forces with the Pathet Laos Communist guerrillas, and is receiving air lifts of ammunition and artillery from the Soviets.

Since Laos borders on Communist North Vietnam, neutralist Cambodia and anti-Communist South Vietnam and Thailand, it is a corridor for further Chinese Communist penetration into southeast Asia.

The big question now is whether the Communists are willing to risk an all-out Korean-type war. The Chinese Communists are desperate to get hold of southeast Asia's resources—rice, oil, ore—and they can't buy them because their exports are committed to Russia. The masses of Chinese throughout the area would make Chinese exploitation of southeast Asia relatively simple.

Hard Look Abroad

The Commerce Dept. last week released its report of the most comprehensive study ever made of U.S. business investments overseas.

The 147-page report, "U.S. Business Investment in Foreign Countries," is issued as a supplement of the "Survey of Current Business." One limitation is that most of the detailed data describes the investment situation of three years ago ('57), but there are frequent comparisons with previous years, and some of the figures are carried up through '59.

Although some of the figures relate to the chemical industry specifically, most of the many tables have only the broad headings of "Manufacturing," "Mining," etc. There are also

* Available for \$1 from the Supt. of Documents, U.S. Government Printing Office, Washington 25, D.C.

breakdowns by region and country.

The study cuts a broad swath, detailing areas such as assets and financial structure of foreign operations, their sales, imports and exports, labor, raw material, tax and service costs. It sheds light on how foreign projects are financed, on capital flows from the U.S. and retained earnings, on the sources and uses of funds. And—probably most significant of all at this point in our economic relations with the world—it analyzes the impact of overseas operations on the U.S. balance of international payments.

Helping the Balance: The survey shows that the pouring of U.S. capital into foreign operations has contributed to the deficit in our balance of international payments (the measure of funds flowing into and out of the country) during this period of sharply increasing investment. But the negative effect is far smaller than might be assumed by looking at the over-all investment figure alone.

In '57, for example, U.S. capital outflow into direct private foreign investments totaled \$2.5 billion. Added to this outflow was the \$3.6 billion paid for imports from direct-investment enterprises.

But partly offsetting this outflow were payments from these enterprises into the U.S.—\$2.5 billion in remittances and fees and \$2.6-3 billion for capital equipment, parts and materials. Result is that net impact of direct foreign investments on the balance of payments was still negative but only by about \$1 billion.

Less-direct factors affecting the balance of payments—such as the stimulation by investment of economic growth and total demand for U.S. products abroad, and the substitution of these overseas units' products for U.S.-made goods—are left uncharted. Of course, the investment impact on the balance of payments will look even better as the new plants start paying off.

Self-Generation: One particularly significant area covered by the survey is the predominant role of retained earnings in financing overseas investment. In '50-'57 earnings retained abroad by manufacturing subsidiaries totaled about \$3 billion, twice the amount of the capital that flowed from the U.S. Almost all of these retained earnings were reinvested. In

'59 earnings of overseas manufacturing subsidiaries hit \$1,129 million, of which \$574 million were reinvested.

Fresh facts on the costs of overseas operations also turn up in the survey. Sales by U.S. chemical companies' overseas manufacturing units totaled \$2.4 billion in '57. Materials and services cost them \$1.5 billion. Employee compensation accounted for 19% of operating costs of these chemical operations over-all, but only 16% of the costs of those operating in Europe.

Although much of this data is relatively old—in terms of the fast-changing foreign investment world—it can definitely be of aid to management.

New Team in Europe

The U.S. and 19 other Western nations signed a treaty in Paris last week forging the Organization for Economic Cooperation and Development, a group designed to be a strong new factor in East-West economic competition. The new organization, which will attempt for the first time to dovetail the West's trade and aid policies, replaces the Organization for European Economic Cooperation (OEEC).

The new OECD inherits a strong base on which to build from OEEC, which had been set up in '47 to handle Marshall Plan aid to Western Europe and had played a major role in lowering its members' trade restrictions. OECD will come into being when at least 15 of its 20 members ratify the treaty—probably by Sept. 1.

Last Wednesday's signing ceremony marked the culmination of a major policy decision made in Washington a year ago. President Eisenhower and his aides—watching the European allies growing strong economically, alarmed at the prospects of a trade war between the two European trading blocs and anxious to meet the Soviet economic challenge more effectively—decided that the U.S. could no longer stand on the sidelines, that it could best help its allies and protect its own interests by operating within Western Europe as much as possible.

To achieve the goals of this new transatlantic and global orientation, OEEC had to be revamped. The U.S. and Canada were only observers in OEEC. They will be full members of the new organization.

national roundup

Rounding out the week's domestic news.

Companies

General Aniline & Film Corp. (New York) last week purchased Douglas Aircraft Co.'s controlling interest in DataGraphic Systems, Inc. (Los Angeles), in a move that left GAF the sole owner. DataGraphic—now less than a year old—is capitalized at \$1 million. The acquisition strengthens GAF's position in microfilm miniaturization and data-handling.

Packaging Corp. of America (Evanston, Ill.)—one of the U.S.'s largest paperboard packaging companies—is broadening its outlook to include plastic packaging materials. It is currently negotiating to acquire Worcester Moulded Plastics Co. (Worcester, Mass.)—a custom molder of expanded and injection-molded polystyrene and other thermoplastics. Packaging Corp.—formed by a three-way merger in July '59—posts annual sales of more than \$138 million.

Sun Chemical Corp. (New York) has acquired Carbro Chemical Co. (Pawtucket, R.I.)—manufacturer of electrical wire coatings. The Carbro Chemical operations will be integrated into the chemical coatings division of Sun's Paints and Finishes Group.

R. J. Strasenburgh Co. (Rochester, N.Y.) has merged with Wallace & Tiernan (Belleville, N.J.). The pharmaceutical operations of Strasenburgh are being placed on the same level with the mechanical equipment and chemical divisions of Wallace & Tiernan. Anticipated research budget for combined pharmaceutical operations in '61: more than \$1 million.

Minnesota Mining & Mfg. Co. (St. Paul) has postponed its proposed merger with Warner-Lambert Pharmaceutical (Morris Plains, N.J.) (*CW*, Sept. 10, p. 31). The planned action was halted pending clearance by Justice Dept.

Expansion

Pesticides: Niagara Chemical Division (Middleport, N.Y.) of Food Machinery and Chemical Corp. will build an Opelousas, La., unit—to be completed by mid-February—for production of agricultural pesticide formulations.

Phenolsulfonic Acid: Monsanto Chemical Co. is installing the first manufacturing facility for phenolsulfonic acid on the West Coast at its Avon, Calif., plant. The new installation will add 50% to Mon-

santo's capacity for the chemical. Uses: as an additive in tin plating and as an intermediate in the manufacture of dyes, pharmaceuticals and tanning agents.

Polystyrene: Solar Chemical Corp. (Leominster, Mass.) will put \$5 million—at a \$1-million/year rate—into expansion of its polystyrene capacity and to make new allied products.

Adhesives: Two adhesives plants are being planned by Arabol Mfg. Co. (New York) and Swift Canadian Co. (Toronto, Ont.). Arabol is adding one in Portland, Ore.; Swift's addition will be in Halifax, Nova Scotia.

foreign roundup

Rounding out the week's international news.

Plastics/Czechoslovakia: Despite growing domestic production, Czechoslovakia looks for growing plastics imports. Imports of polystyrene, high- and low-pressure polyethylene, and polytetrafluoroethylene (Teflon) will continue at least until '64, when local production of all of them is scheduled. Polypropylene production is also slated, although none is now used in Czechoslovakia. Government planners predict these total tonnage requirements for '61 and '65, respectively: phenol plastics, 6,200, 8,000; amino plastics, 150, 430; polystyrene, 800, 3,200; polyethylene, 300, 5,200; polyamides, 550, 900; laminated polyester, 1,600, 3,400.

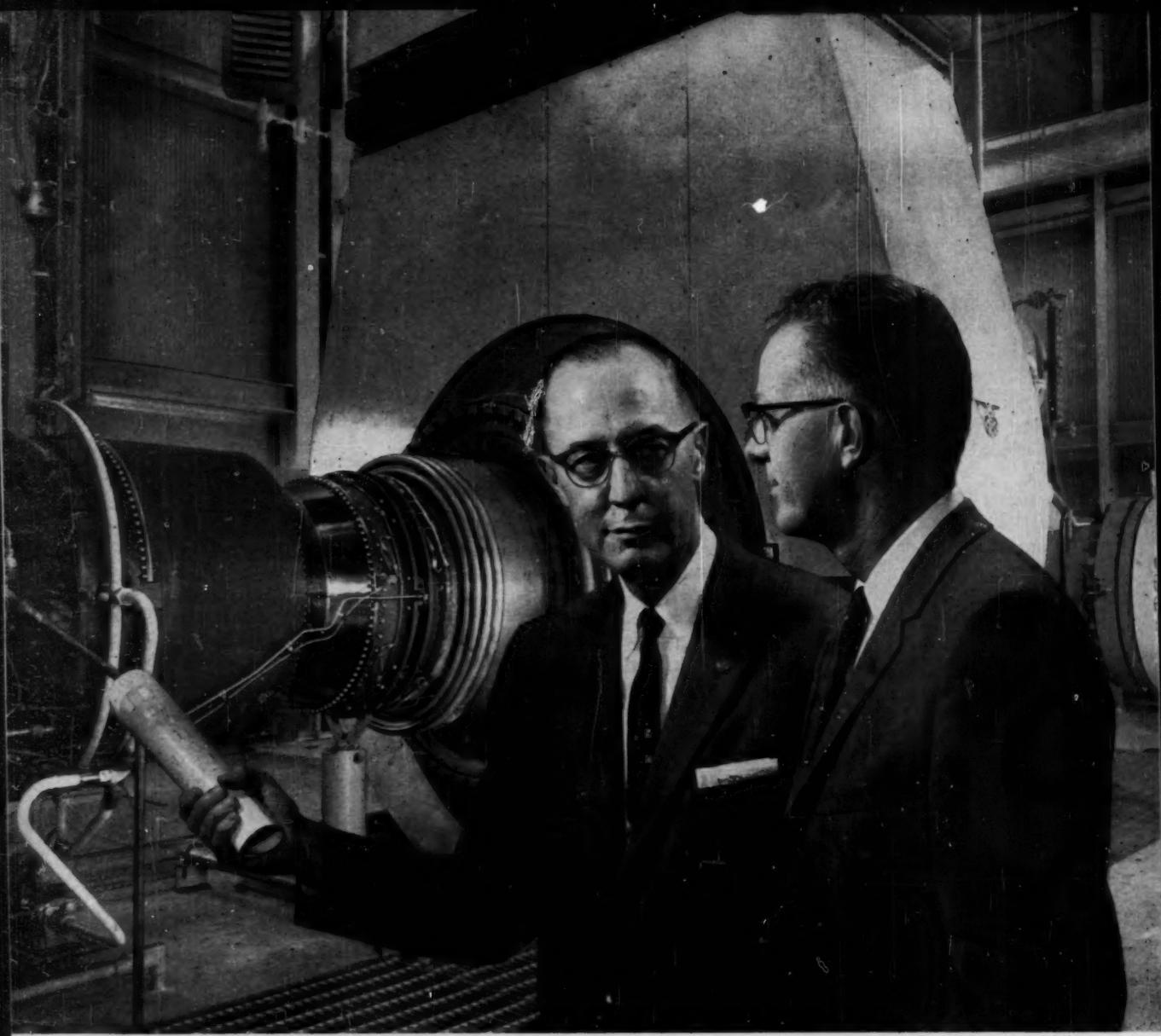
Polyethylene/Brazil: Union Carbide is expanding its polyethylene plant near Santos from 9 million lbs./year to 24 million lbs. The new capacity is due onstream late in '61.

Tariffs/Nigeria: To raise more revenue, Nigeria is upping import duties and excise taxes on a long list of commodities, including soaps and detergents, textiles, metal, packaging materials.

Urea-Formaldehyde/India: India hopes to end imports of urea-formaldehyde by the end of '61. The government has approved construction of eight resin plants; total capacity: 6,000 tons/year. Two are already in production, using imported raw materials. Imports totaled 1,573 tons in '59, 800 tons in first-half '60.

Acrylic Fibers/U.A.R.: The United Arab Republic is seeking technical aid in building a plant to produce acrylic staple fiber.

Citric Acid/Italy: The Dutch firm Noury & Van der Lande (Deventer) and the Italian company Rumianca have set up Noury-Rumianca, will build a 3,000-tons/year citric acid plant at Avenza, near Carrara, Italy.



R. L. Boyer, Vice President and Director of Engineering, and W. B. Boyum,
Manager of Gas Turbine Sales, The Cooper-Bessemer Corporation report...

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Washington Newsletter

CHEMICAL WEEK
December 24, 1960

Businessmen are breathing easier now that Kennedy has completed selection of his Cabinet. The feeling of reassurance is evident in Washington. These men are "moderate liberals" who believe that, in the long run, the best way to achieve economic growth is to encourage private industrial expansion.

Even in Labor Secretary-designate Goldberg, business has a man with whom it can bargain. He is a tough bargainer, but holds the respect of industry leaders who have faced him across the table. He also is originator of a plan to get management and labor leaders together on a wide range of issues away from the actual bargaining table. This will get a push in the new Administration.

In Ribicoff, at Health, Education & Welfare, Washington will have a man who gave Connecticut its most businesslike administration in years. He, like Kennedy's Commerce Secretary, Hodges, is thoroughly attuned to the needs of industry. So, to an even greater extent, is Defense Secretary-designate McNamara.

In matters of foreign trade and competition, Cabinet members have one thing in common—and in this they agree with Kennedy: they will promote freer trade among nations, advocating protection for American industry only if the need is proved beyond any doubt.

Robert Kennedy, as Attorney General, can be expected to press antitrust cases with special vigor. He also will crack down on labor racketeering, with Teamsters President Hoffa a pet target.

Treasury Secretary-designate Dillon is a free-trade, liberal Republican who has won the respect of most Democrats during his service in the Eisenhower Administration. He is as close to the Kennedy philosophy of government as most Democrats in the Cabinet.

There are, in short, no "flaming liberals" in the Cabinet. Kennedy's department heads will press traditional Democratic policies, but not at the expense of any particular industry.

A new era in antitrust prosecutions may be at hand. There are two reasons for this speculation. One obviously is that the Kennedy Administration, including the Attorney General, undoubtedly will have new ideas on the subject. The second is the government's recent loss of its antimerger case against Continental Can Co.

Four years ago, the Justice Dept. asked the courts to ban a proposed merger between Continental and Hazel-Atlas Glass Co., a bottle maker. Under the broad language of the Clayton Act, the Justice Dept. claimed the right to block mergers of firms that make similar but not identical products. This, it contends, would lead to concentration of economic power—exactly what the antitrust laws try to prevent.

Washington Newsletter

(Continued)

A federal judge has disagreed. He ruled that there is some merit in the government's contention but the Justice Dept. did not present sufficient evidence to support its case.

Until this ruling, the government had received court approval for its concentration-of-power approach. The Supreme Court ruled that Du Pont holdings of General Motors shares violated the Clayton Act. A federal judge held that the merger of Bethlehem Steel with Youngstown Sheet & Tube was unlawful. Continental seemed the next logical step.

Government lawyers will await a written opinion on the Continental case, due early next year, before deciding on a new course of action. They take some hope in the tacit approval of their theory. But right now their thinking is that future antitrust emphasis may have to be placed on price fixing and bid rigging.

Government success in nailing down price-fixing charges against major electrical equipment makers adds steam to a possible major antitrust attack along these lines.

Evidence of price fixing in other industries is already being submitted to federal grand juries. Still more is being prepared for submission to grand juries not yet called.

Fast action on water-pollution legislation in the new Congress is promised by Sen. Robert S. Kerr (D., Okla.) and Rep. John A. Blatnik (D., Minn.). Both promise January introduction of bills that would:

- Create five regional laboratories for research.
- Establish a federal antipollution agency in HEW that would report directly to the Secretary.
- Broaden enforcement to permit the new agency to act against pollution of intrastate waters at the request of the state's governor.
- Allocate federal grants, probably a total of \$100 million, for construction of community antipollution plants.

Blatnik says he will consult Kennedy and Ribicoff before submitting his bill. If it receives their active support, as seems likely, its chances of passage would be enhanced.

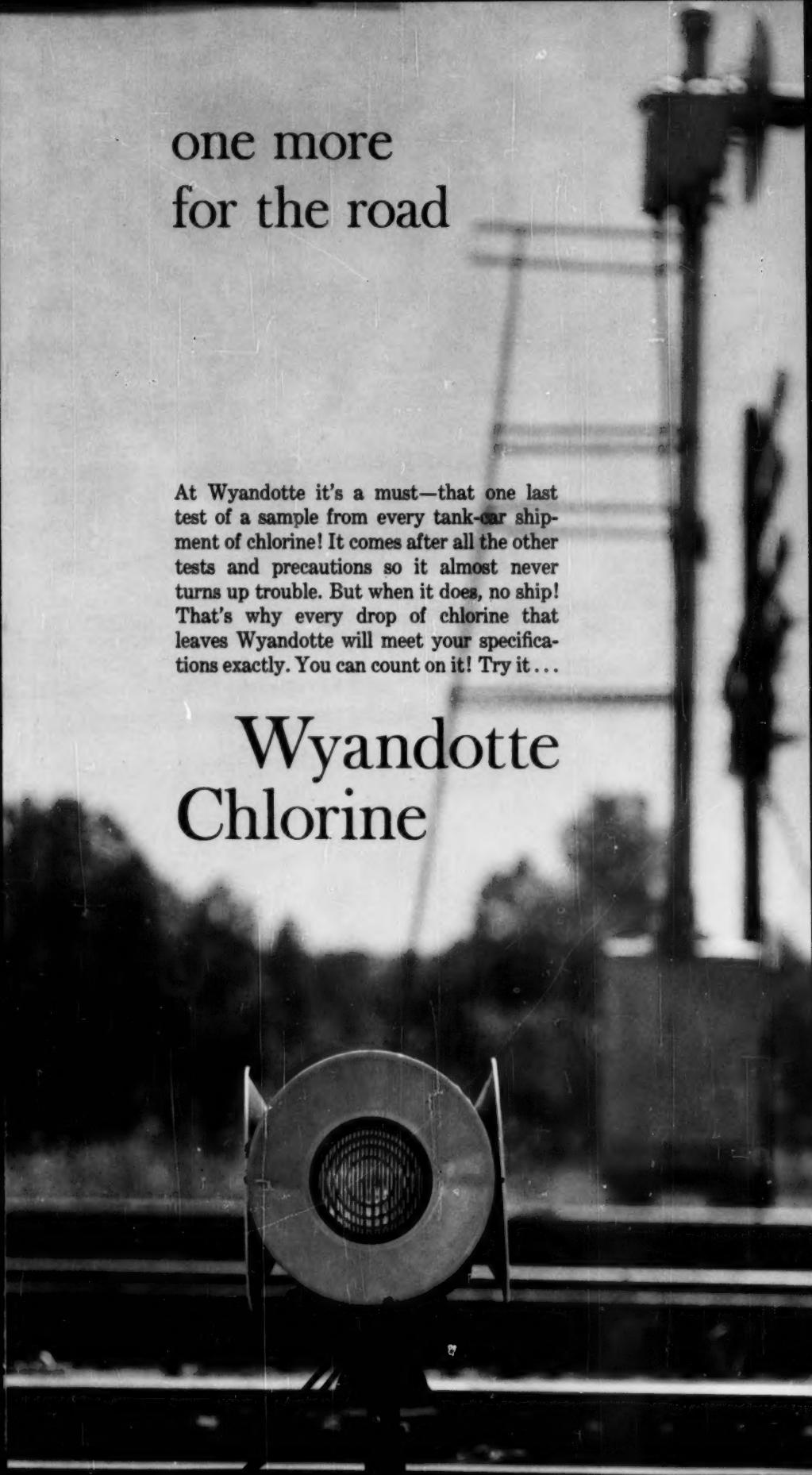
Reorganization of the Atomic Energy Commission is being talked about. Crux of the atom problem: there is built-in conflict for a five-man commission that has the triple job of promoting a private industry, passing on the safety of reactor facilities, and then licensing a plant for operation.

Suppliers of the big reactors have a stake. A reorganization of the commission might go several ways: (1) putting radioactivity control in the hands of the Public Health Service, (2) putting licensing in the hands of the Federal Power Commission, or (3) leaving promotion of a peaceful atom industry to the commission. Moderator and fuel element producers would be involved. The issue will come up soon after Inauguration Day.

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FORECAST



Ahead: a year of economic contrast for the chemical process industries and business as a whole.

The year ahead will be a year of contrasts. Economic activity will dip in the early months. By midyear, though, an uptrend will be evident, setting the stage for a strong last-half finish.

Look for gains in sales, a slight slackening in production. The sales increases will be relatively minor, compared with gains in other years.

A tighter squeeze on profit margins in most lines is a foregone conclusion. The chemical process industries, in particular, will feel this pressure. Reason: sharper domestic and foreign competition, plus continued overcapacity for most products, will outweigh rising costs, militate against price increases.

In the over-all economy, expect these developments: a rise in unemployment; a slight cutback in capital spending; a pick-up in housing starts; increased government spending; a drop in private investment for construction, producers' durables, inventories.

Watch for "Kennedy conservatism" to win out over government-by-experiment, as propounded by some elements in the Democratic party.

But the new President will be pressured, especially by labor, to spend billions for construction of schools, highways, other public works to blot up some of the rising unemployment.

The outlook for '61, at least, would have been substantially the same, even if the Republicans had won the election.

Basically, the economy is healthy, robust enough to preclude a draw-out recession in '61. Gross National Product (GNP) for '61 as a whole will likely outstrip the '60 record of \$503.5

FORECAST '61

billion by a good \$10 billion. That would be a \$30-billion increase over '59 (see chart, below).

Powerful economic forces support the brighter outlook in total business volume.

Consumer income and expenditures. Both are now at record levels, will continue to edge upward. Consumer spending in the new year will likely total about \$336.5 billion—a modest gain, only \$9 billion (less than 3%) above '60, but nevertheless a hefty factor.

The increase will come in outlays for soft goods such as food and clothing, and for services. Spending for durables (appliances, autos, etc.) will be spotty at best, probably drop \$2 billion for a '61 mark of \$41 billion, compared with this year's \$43 billion.

Capital spending plans for '61, and '62, will stabilize at around \$35.1 billion annually, a slim 3% below '60. But compared with the 18% drop that weighed heavily on the economy in the '57-'58 recession, the anticipated decline will be insignificant.

Most of these expenditures, a new McGraw-Hill survey reveals, will be for modernization. Outlays for new plants, new capacity, will be reined in 5-7% next year. But total industry capital investment on the order of \$35 billion/year is a solid prop for lively over-all business activity.

Spending by government agencies (federal, state, local) will be jacked up \$6 billion over '60 expenditures. The breakdown: federal, up some \$3 billion, to about \$55 billion during the new year; state and local, another \$3 billion.

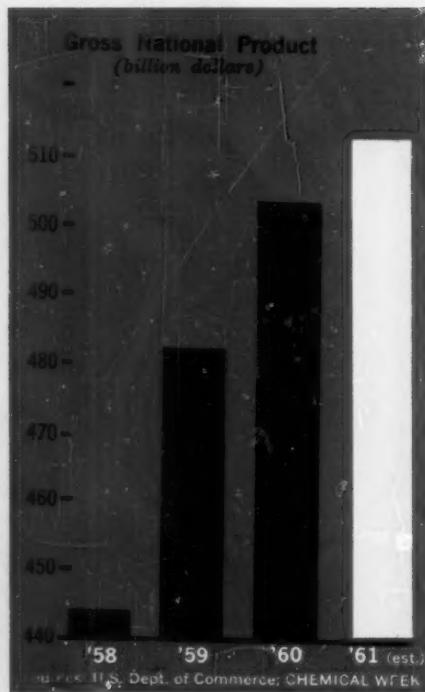
The hike in federal spending was in the works long before the Presidential election. A large chunk of the increase will go for stepped-up defense efforts.

There is little likelihood that the new Administration will change these plans, barring, of course, dramatic international developments.

A switch from accumulation to reduction of inventories will cut deeper into private business investments in '61. Inventory buildups (steel, finished products) accounted for nearly \$4 billion of such business spending in '60. This will shrink to less than \$3 billion, take some of the zip out of the economy until excess stocks are worked off and reordering begins in earnest. The turning point: about midyear.

The dips and climbs will be moderate. The Federal Reserve Board Index of Industrial Production, for instance, will show factory output declining from 107 (revised basis) in the final quarter of '60 to about 100 in the early months of '61. (Basis: 1957=100.)

U.S. industry capital investment will be \$35.1 billion—just 3% less than in '60.



Average FRB Index for the new year will be a little higher—about 103. The final for '60 was 108 (see chart, right).

In the first and second quarters GNP will also slip some. But chances are that it will not drop below the half-billion-dollar mark. Then, as noted above, it will climb, finish out the year at a strong \$513 billion.

That's the big view.

How will the chemical process industries fare in '61? Slight increases—or, at worst, thin cutbacks—are in store for this industrial category, which includes chemicals and allied products, rubber, petroleum refining, glass, paper and related products, among others.

Dollar volume of output is \$93.6 billion this year. The increase over '59 is less than 5% and falls considerably short of earlier, overly optimistic predictions. The '61 forecast: about \$95.8 billion, 2½% above '60.

And the CPI's physical output (which in '60 was about 4% over '59) will inch up an additional 2% in '61.

CPI capital spending will be a shade less in '61 than in the year now ending. Score: \$3.92 billion vs. \$3.94 billion.

Research and development outlay, however, will again shatter all previous highs. The CPI plans to pour more than \$1.36 billion into R&D next year, about \$400 million more than it spent in bustling '57. The new figure is approximately \$80 million higher than the '60 record, \$1.28 billion.

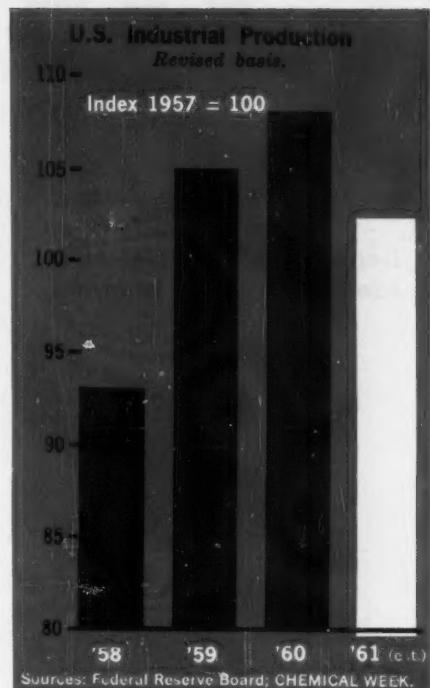
Some \$28.6 billion worth of chemicals and allied products will change hands in '61—a modest 3% sales increase over '60, but a new high nonetheless.

Despite this increase in gross income, profits after taxes will barely top \$2.07 billion, about \$11 million less than expected in '60. The profit margin, as a percent of net sales, works out to 7.25 in '61, 7.50 in '60.

The relatively slow start for the '60-'70 decade comes as no surprise (see *CW, The Next Five Years, June 21, '58, p. 51*). The big surge is still expected to begin about '63, go on to fulfill predictions that the 10-year period will indeed warrant the label "The Golden Sixties."

More money will be spent for new plant and equipment. In '60 the chemical industry increased spending—mostly for modernization—about 30% above '59, for a new high of \$1.61 billion. Earmarked for '61: close to \$1.64 billion.

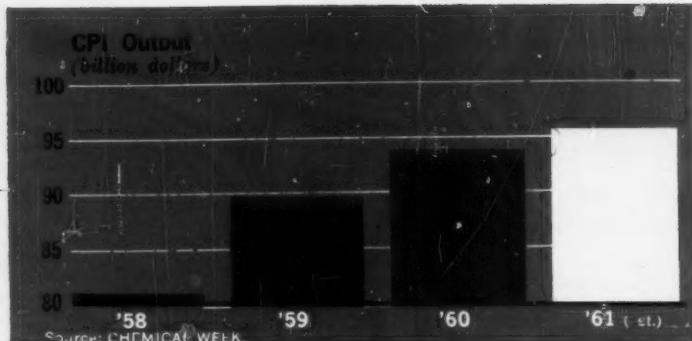
Where will the expansion money come from? Continuing the trend over the past few years, practically all of it will come from internal sources. This includes set-asides for amortization, depreciation and depletion, retained earnings. Con-



The first years may be slow, but don't rule out the bright 10-year outlook—the "Golden '60s."

FORECAST '61

**Look for more trust-busting,
more regulations as
Democratic Administration
spells out action program.**



siderably less than \$200 million will be externally financed.

Kennedy believes in depreciation reform, and this will become a major subject once his Administration seeks an overhaul of the tax code. If government revenues grow enough, the Treasury Dept. may be inclined to take a more generous position regarding the useful life of capital equipment. Business then would get some relief.

The Washington outlook . . .

The chemical industry will feel the effects of Democrats' legislative and bureaucratic activity in antitrust enforcement, drugs, water pollution.

The Republicans have been tough in enforcing antimonopoly laws; the incoming Administration will feel they must at least equal the record of the outgoing party.

The Federal Trade Commission could take a more important antitrust role. It will depend on the new FTC chairman, of course, but many Washington Democrats believe that the commission's power to attack monopoly has been overly restrained during the past eight years. They feel that FTC, not the Justice Dept., should be the federal government's No. 1 trust-busting agency.

A bill requiring big companies to give premerger notice to the government will probably be reintroduced in the coming session of Congress. Such legislation has been around for years, but has never gained much support outside a small group of senators and representatives.

It's not clear where Kennedy stands on the idea. A push from the White House could add enough impetus to get a premerger notification bill through the Congress. It's a long shot.

A revived pre-price-notification bill has an even slimmer chance of getting through next year. If passed, it would affect basic industries such as steel.

Congressional sentiment, though, is that such legislation is too extreme, would give the federal government too much control over prices.

What about direct price controls on drugs? There's a good chance that legislation aimed at bringing drug prices down will be introduced in Congress. But legislators will probably shy away from any direct schemes, despite Kefauver's sensational hearings on drug industry activity.

More likely: greater federal investigative powers; changes in patent laws.

Count on increased regulation of food and drugs. FDA will probably seek to extend its control over cosmetics and medical products by requiring proof of safety before a product hits the market. Now the agency can act only after a product is commercially available and found to be harmful.

March 6 is the final deadline on getting FDA approval for use of food additives. There will be anguish in the industry if Congress doesn't act fast to extend the date (*CW Viewpoint*, Oct. 15, p. 7).

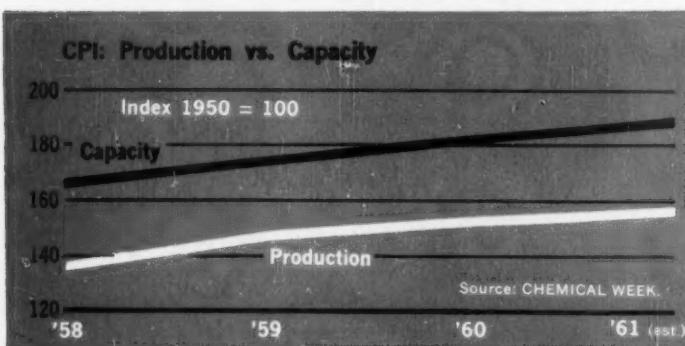
Thus far, FDA has set tolerances on several dozen products in addition to those on the "white list," which are commonly recognized as safe. There are literally hundreds on which laboratory testing has not yet been completed.

Industry is certain to ask Congress to extend the deadline; FDA will probably support the request.

Congress may well overhaul FDA's handling of drugs as a result of Kefauver's investigations and a study by the National Academy of Sciences. The academy has recommended that FDA pass on the efficacy as well as safety of new drugs.

There may be tighter regulation of drug labeling and advertising; more factory inspection.

Water-pollution control will get more attention. Look for



March 6 is final date for FDA approval on use of food additives—unless Congress acts quickly to extend it.

FORECAST '61

increased Congressional grants for sewage treatment plants. An effort may be made to upgrade pollution control by giving it to an independent agency, separate from the Public Health Service.

The international scene:

Foreign chemical-producing countries will be fighting harder for world markets.

But U.S. producers won't fare too badly in world trade, despite tremendous strides in diversification and production of chemicals in Germany, Japan, France, Italy.

U.S. chemical exports continue to climb. In '59 we shipped nearly \$1.5 billion worth of product. This year's total will be up 13%. During '61, value of chemical exports may be higher than currently estimated—\$1.75 billion.

But imports also are slated to rise next year—probably more sharply than exports. Anticipated value of imports: over \$360 million, compared with '59's \$347 million.

Chief target of U.S. overseas activity (exports, investments) is Western Europe. Its boom may level off next year but won't run out of steam.

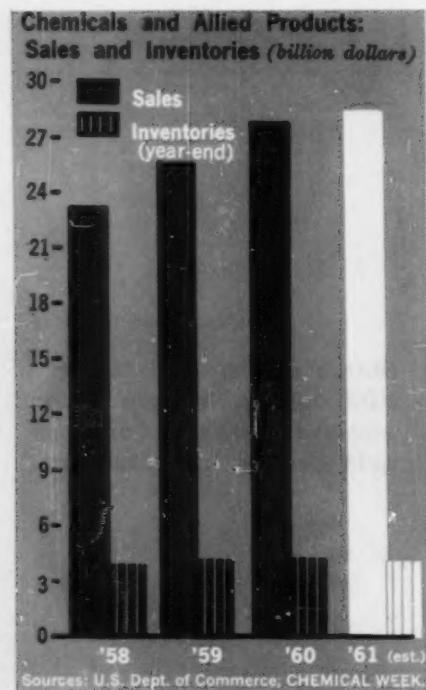
Average rate of increase of Europe's Gross National Product will likely be closer to 4-5%, rather than the current rate of 7-8%.

Here's how our major foreign competition shapes up:

Great Britain. This is Europe's one notable economic soft spot. Industrial output index there has been flat since April—but the chemical industry has not slackened in growth. Next year, chemical production will likely level off; some areas—plastics, for one—may grow weaker. Imports will continue to rise. Whether Britain suffers a recession in '61 will depend largely on its ability to boost exports. But this is a tall order. British prices are climbing; world competition is tightening; intra-Common Market trade is becoming more acute.

France. Here, as elsewhere in Europe, optimism is higher. The French economy is still on an upgrade—and the chemical industry is its most dynamic sector. Chemical output will be up about 20% this year, spurt an additional 16% in '61. French chemical sales—some \$3.5 billion in '59—are rapidly approaching the \$4-billion mark.

West Germany. Germans also expect the boom to continue well into '61. Chemical sales, for instance, are estimated at about \$5.47 billion for '60—a 12-13% hike over '59. In '61 the rise may be about 7%, slowed down only by critical limits of plant capacity and labor. U.S. chemical sales to Germany may increase 30% or more next year—on top of this year's 50%



increase over '59, which pushes the '60 total to about \$210 million, compared with the '59 figure of \$141 million.

Italy. Estimated '60 sales by Italian chemical firms, have soared 25% above last year, to a \$900 million high. Prediction for '61: another increase of at least 20%. With industrial expansion in Italy expected to continue barreling along, chemical imports will move apace; they're up a total of 60% this year, including an 80% increase in chemicals from the U.S.

The European chemical business faces a cost-price squeeze. It's not yet as serious as that in the U.S., but it's already evident. Wages in Europe are moving up, prices down.

There won't be an early settlement of the split between the Common Market and the Outer Seven. Practically no progress in bringing them together has been made, and none is likely until next fall. The first meeting of the Organization for Economic Cooperation and Development (OECD) will take place then.

Meanwhile, watch relations between key European nations—particularly between France and its NATO allies. Unless these are smoothed there's little solid hope for broadening economic integration.

In Asia, Japan remains the best prospect for U.S. chemical industry. The country is embarking on a program to double its GNP in 10 years, and capital-short local producers can't boost capacity fast enough to keep up with demand.

Japan's trade liberalization policy, of course, means that import licenses are now granted automatically. This could result in about 10% more over-all imports next year.

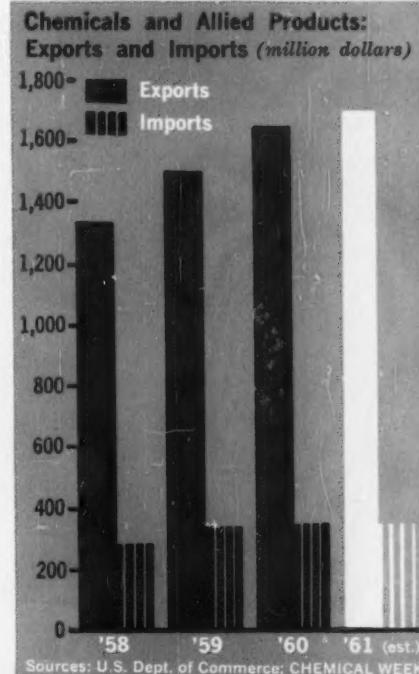
Prospects in Latin America are less cheerful. Mexico may increase its purchases of U.S. chemicals 10% in '61, but other big potential markets in South America (e.g., Brazil, Argentina, Venezuela) will be crimped by continued money shortages.

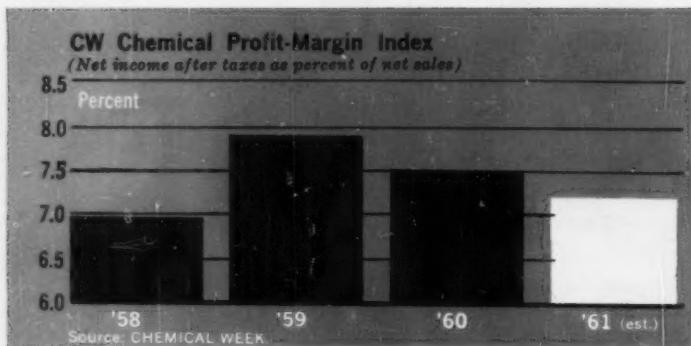
Barring severe political or economic eruptions, U.S. chemical companies will probably go through with plans to increase overseas capital expenditures. Overseas spending next year for chemical and allied products plants is estimated at almost \$286 million. This year's investment amounted to \$256.4 million.

The most striking pattern in overseas spending is the swing toward the Common Market. In '59 U.S. chemical firms put 8% of their \$191 million foreign expenditures into this area; in '61, 32% of the larger total is earmarked for Common Market plant sites. That's about \$91.5 million.

Russia will be a bigger factor to reckon with in world chemical trade. But in '61 it will move in chiefly as a buyer. More

U.S. chemical companies will hike overseas investments; over \$91 million earmarked for Common Market area.





FORECAST

Labor and management goals are different, but hopes are identical—a year of relative industrial peace.

orders for whole plants will be placed in England, West Germany, Italy, Japan. The emphasis on plastics and synthetic fibers will continue, but Russia wants cellulose plants too.

The satellite countries will be major suppliers for large stopgap chemical purchases by the Soviet Union next year, but Western European chemical makers will also cut in on the business.

Meanwhile, in the U.S., labor-management relations will be relatively peaceful. On the one hand, a slowdown in economic growth will cause unions to think hard before enforcing demands with costly walkouts. Treasuries of major chemical unions are not bulging.

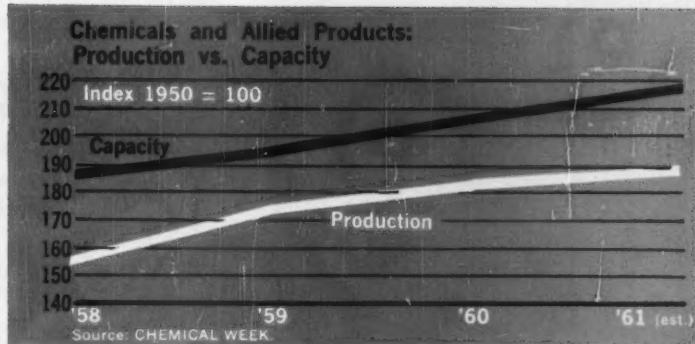
This won't prevent labor groups from working harder to organize, consolidate what they have. Likely pattern of action: The International Chemical Workers "consolidated local plan," wherein the union's smaller locals are tied together to afford strength of larger locals. The plan also acts as catalyst and seed-bed for further organizing in regional areas.

Management will strive harder to regain prerogatives. But, to promote labor peace, it will be prepared to offer fair-size percentage increases in wages in return for longer-running contracts. There will be some effort to put less money into pay envelopes, more into fringes.

Wage increases will parallel the temper of business in '61. On this basis, it could mean average 8-10¢/hour hikes for chemical workers, generally, in the first half of the year, probably 12-15¢/hour as business picks up later on. These averages may be a little higher on the Gulf Coast and in the industrial Northeast.

The profit margin squeeze will put pressure on management to trim some of the frills, such as big committees, lengthy and expensive studies. Emphasis will be on professionalism—i.e., interchangeable managers who can administer various departments.

1961



States will increase radiation controls, particularly those affecting isotope users. Some cases will be brought up to clarify workmen's compensation laws to determine what constitutes exposure danger levels. International Chemical Workers may press this one.

Supply/demand picture will be in better focus next year. Most chemical shortages will be alleviated—benzene, phthalic anhydride, naphthalene supplies will grow.

Look for a sales pickup in chlorine, phenol, salt cake, isocyanates, potash, ammonia. Brisker demand may lead to further capacity increases.

Excess capacity will continue in several plastics raw materials, including acrylonitrile, polypropylene, polyethylene, polyvinyl chloride.

On the whole, though, the plastics industry will prosper. Total U.S. resins and plastics material production in '60 will tally close to 6.5 billion lbs., compared with 5.9 billion lbs. turned out last year. Estimate for '61: about 7.4 billion lbs.; by '65: nearly 10 billion lbs./year.

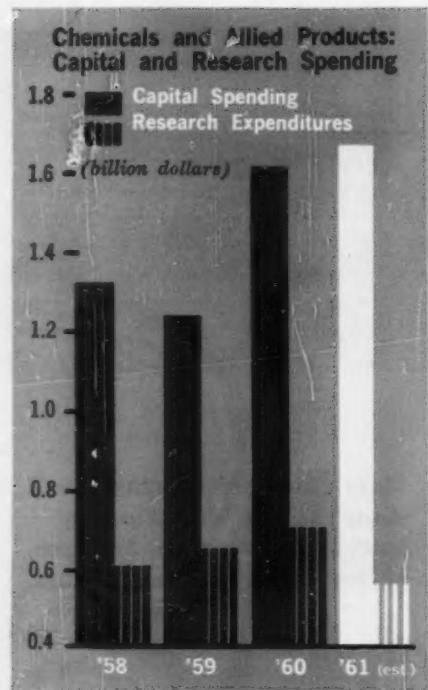
Textiles will not gain during most of '61, but look for an upturn in the latter months. Nylon, polyesters, acrylics and cellulosics will ride the plateau—and benefit from the expected improvement.

The nylon-rayon battle for the tire market will intensify. Nylon may well slice out a share of the original-equipment field, as well as further consolidate its gains in replacement tires.

Supplies of some agricultural chemicals will be tighter in '61—potash, for one. Worldwide demand is up, but some foreign (France, Spain) production has been cut because of strikes, accidents. New Canadian facilities to help ease the potash pinch won't be in until '62.

U.S. phosphorus and phosphoric acid are in close balance

Most chemical shortages will disappear in '61. Capacity increases coming for benzene, phthalic, naphthalene, others.



A banner year for specialties producers. Paints, aerosols, cosmetics headed for new records in '61.

now, even a little tight in spots. But sizable capacity hikes, most of which are due for '61 operation, will ease the situation.

Specialties makers are in for another good year. Their profit picture should look better than that of basic chemical producers. Reason: specialties makers will be able to cash in on overcapacity, softer prices on some chemical raw materials, yet maintain or increase tags on their own goods.

Volume of paint sales will probably remain the same as in '60, but anticipated price increases will push '61 sales to a peak \$2 billion.

Aerosols keep rolling along. This year more than 600 million units were sold. Forecast for '61: at least a 7% increase. The number of new aerosol-packed products will taper off, but there's a trend on for fillers to introduce and merchandise their own products. An aerosol floor polish is a probability for '61.

Stricter government controls on some specialty items—drugs and cosmetics, as previously mentioned—will cause headaches for some manufacturers. Two major problems: (1) how to operate under the new color additives amendment; (2) possibility that Congress will pass a cosmetics pretesting law.

Worth watching: Kennedy's proposed Dept. of Urban Affairs. It could mean government setting of specifications for some items (e.g., fertilizers) bought by the consuming public.

Sales by the cosmetics industry will rise to about \$1.8 billion this year, from \$1.66 billion in '59. Most makers anticipate a similar increase in '61.

Prediction for '61: at least two companies will branch out into the toiletries field; one a hair-coloring outfit, the other a major paper products company. A large oil company may enter the specialty market next year with a wide range of products.

All sales and distribution functions will be eyed closely as management strives to improve efficiency, boost profits—again, the accent on profits, not just bigger sales volumes.

Sales costs will get the closest attention in years. More low-profit products will be dropped, resulting in simpler product lines. Small-order costs will be pared by faster, cheaper handling methods.

Purchasing men will be choosier (as they operate on shorter inventories), expect more service, buck chemical price hikes. Raw-material producers will have to stock more of the consumer's inventories for him, be ready for delivery on short notice.

Transportation rates are headed upward next year. But there will be selective rate cuts where competition for the business demands it. Look for more "incentive rate-making" of all kinds;

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moves for guaranteed rate arrangements, higher car loadings, more giant rail cars.

Traffic men expect the new Administration to streamline regulatory agencies, possibly relax some regulations. This may come after the Doyle transportation study group submits its report. Hoped for: more liberal piggyback rate making.

Credit men will have a rougher time next year. Right now fewer than 78% of all CPI customers are paying their bills within 30 days; that's the lowest proportion in six years. It may drop to 75% in '61, lowest figure since the '40s.

And bad-debt losses are rising at the same time. Nub of the credit man's upcoming problem: trying to hold onto badly needed business, lure overdue receivables.

Outright cutting of marketing personnel isn't in prospect, and chances are that few firms will move in that direction for the sake of economy. But some staffs may be reduced by attrition—nonreplacement of those who leave or are transferred. More people will be moved around, though, given added functions.

It could be a year of good equipment buys. Equipment manufacturers will continue to spend more money to develop better equipment at lower prices to get jobs. This is especially true in the utilities field—power generation and distribution.

Utilities are putting the pressure on electrical supply companies to come up with better, cheaper electrical equipment. Although utilities will reap first benefits, chemical and other manufacturers will eventually profit by improved power distribution systems.

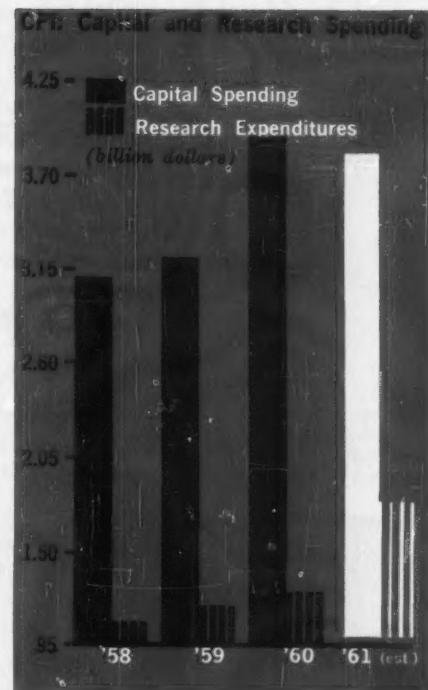
In general, power costs will be higher than they were in '60.

The era of computer control isn't yet ready to blossom— but progress is being made. There are now a couple of dozen computer-controlled process units operating in the U.S.; more are slated for next year.

In the chemical industry, where competition is acute, computer control of plants may be too costly. Next year more companies may take the mobile data-logging computer approach (*CW, Dec. 10, p. 77*) in determining whether on-line computers are needed for various processes.

One trend that may develop further: Use of analogs and digitals together. The analog simulates the process until the process details are fully digested by the digital, which then takes over full control.

The CPI next year will spend a record \$1.36 billion on research, and about \$760 million of this will be in chemicals and



Credit men will find it harder to collect from CPI customers; bad-debt losses likely to increase.

allied products. Comparable expenditures in '60 were \$1.28 billion and \$710 million, respectively.

Boost in missile spending by the new Administration could further increase the '61 research outlays, but the amount is still problematical. Private research groups, however, are counting on this kind of work to increase their income.

Both solid and liquid propellants will be getting more attention. The Navy hints it is setting records in high specific impulse ratings with double-based propellants made at its Indian Head, Md., plant.

Other top '61 research targets:

Fuel cells that can burn cheap fuels (e.g., gasoline). Fifty government, industry and university labs are pondering this problem.

New energy sources—e.g., the Navy is studying reversible (by temperature change) chemical reactions as a means of generating electricity.

Cancer fighters including a cancer vaccine; more emphasis on investigation of viruses as a cause of cancer.

Research is also driving down the cost of desalting sea water. A bench-scale freezing process evaluated at Cornell University, for instance, is expected to put the cost at less than 40¢/gal.—close to the average for fresh water in most sections of the U.S.

It all adds up to this: The U.S. is in for a 12-month period of contrasts within a high level of general economic activity.

Competition will intensify—for markets, processes and products both here and abroad. But this will only enhance the challenging aspects of a year that could—with hard work, increased efficiency and a sharp awareness of cost-cutting possibilities—turn out to be one of the best years the chemical process industries have known.

FORECAST

Modern Aloyco casting operations pay off for customers!

As the world's leading specialist in the manufacture of Stainless Steel Valves, Aloyco constantly seeks new techniques, new equipment and new ideas for improving product uniformity and quality. Close integration between sales, engineering, foundry and all phases of manufacturing result in better control of quality, prompt deliveries, and more flexible customer service.

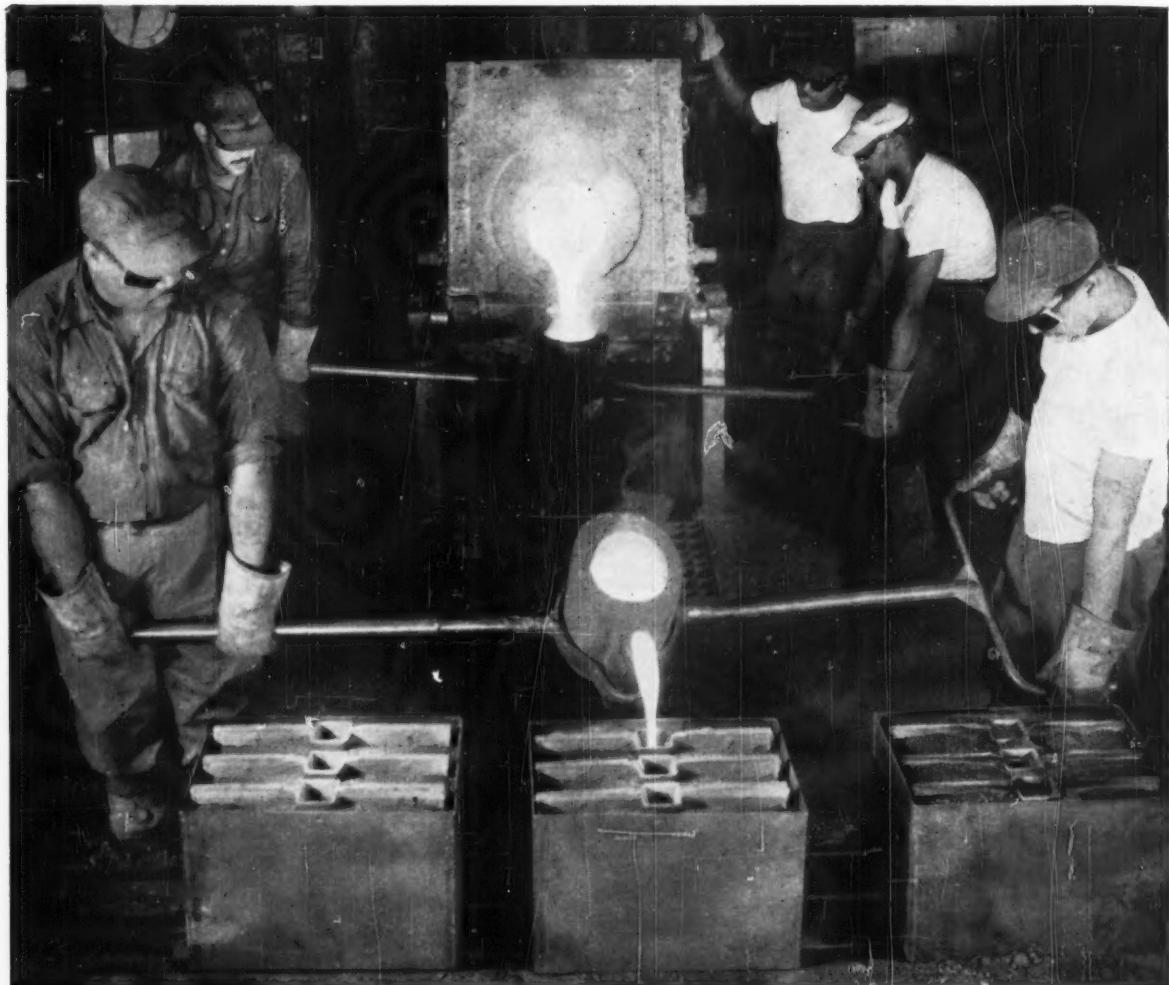
Aloyco combines over 30 years of specialized experience with the most advanced equipment for putting that experience to work on your corrosion problems. Technically qualified Aloyco men are available throughout the country to help you. Alloy Steel Products Co., Inc., 1328 West Elizabeth Ave., Linden, N.J.



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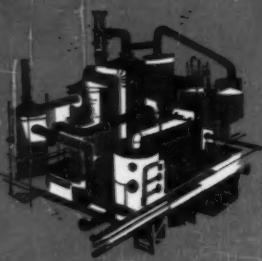
Part of Aloyco's foundry facilities include modern shell moulding techniques which permit unusually high dimensional accuracy. Radiographic

inspection and dye penetrant testing are part of a comprehensive and rigid control program that assures castings of highest quality and uniformity.

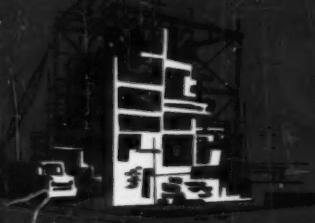


NITRIC ACID

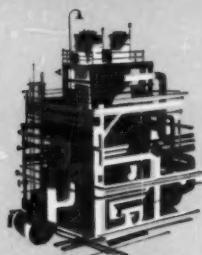
High Pressure Self-Sustaining Process



SULFURIC ACID



NITRIC ACID Concentrating Plant

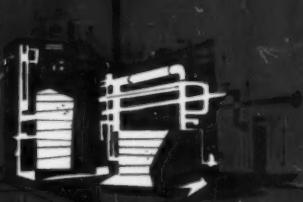


SULFURIC ACID CONCENTRATOR

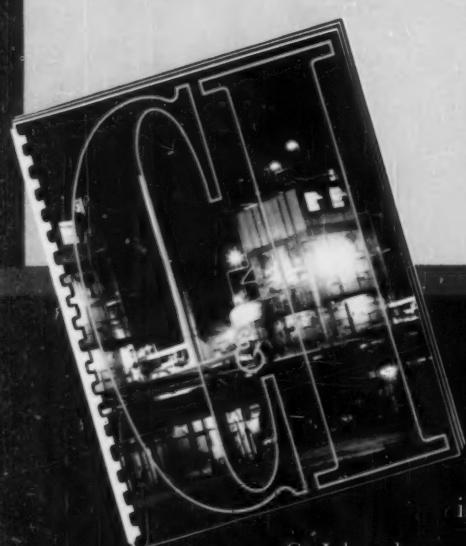
the C&I



AMMONIUM NITRATE Storage & Filling Tower



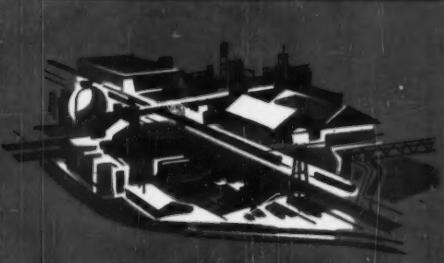
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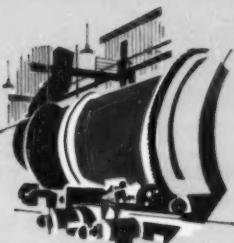


NITRIC ACID—High Pressure Process



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for '61



FUME ELIMINATOR



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News from

National Carbon Company

Division of Union Carbide Corporation • 270 Park Avenue, New York 17, New York
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National Carbon Design
Engineers expand your
engineering force



J. L. MILLER
Design Engineer

Mr. Miller graduated from Yale University with a B.S. in Chemical Engineering and joined National Carbon Company in 1948.

Since then, Mr. Miller has worked on applications of carbon, graphite and "Karbate" impervious graphite materials in corrosive services both in the field and in the laboratory. He has been particularly active in application engineering and development of graphite anodes for impressed current cathodic protection.

SAVINGS ON MAINTENANCE COSTS

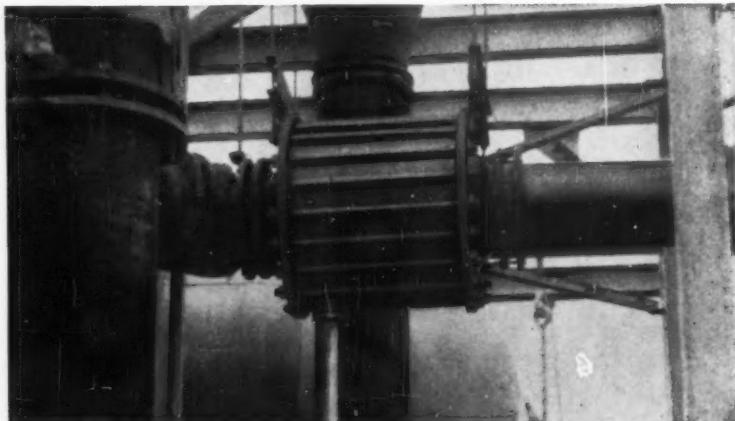
Two typical reports show trouble-free service with "Karbate" impervious graphite pumps in chemically cleaning equipment.

A petroleum company using a Type F centrifugal pump on its portable equipment cleaning rig reports, "We are very pleased with the performance of this equipment and would not hesitate to recommend its use to others for cleaning operations."

A chemical equipment cleaning company uses Type F centrifugal pumps for transferring muriatic acid from tank cars to storage tanks and from these tanks to trucks. "Karbate" impervious graphite pumps were installed here after attempts to move the acid by other methods were unsatisfactory. Maintenance on other corrosion-resistance lined pumps proved too costly. Twelve "Karbate" impervious graphite pumps, one to each station, are handling this operation with virtually no maintenance.

"KARBATE" EQUIPMENT USERS REALIZE MANY SAVINGS!

Users of "Karbate" Impervious Graphite Equipment Report
Savings in Recovered Product... on Long Equipment Life...
and on Maintenance Free Operations.



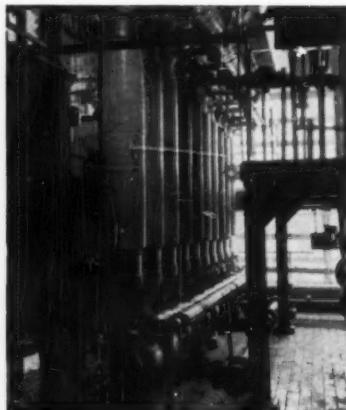
A 20" "Karbate" Impervious Graphite Entrainment Separator in an Acid Vapor Line.

SAVINGS IN RECOVERED PRODUCT

After installing a 20" "Karbate" impervious graphite Type MV entrainment separator on a spin bath evaporator, a major rayon producer recovered chemicals valued at approximately \$2800 a year. These

savings paid the equipment cost in roughly a year.

Based on the proved efficiency and savings in this installation, this company has purchased eleven additional units for use throughout its operations.



SAVINGS ON LONG EQUIPMENT LIFE

In 1951, a large pharmaceutical producer installed 10 "Karbate" Series 240A shell and tube heat exchangers to cool an organic slurry containing HCl. These exchangers have been in service for nine years, and are operating today with minimum maintenance.

Each exchanger has twenty-four 7½' long tubes, 7/8" I.D. x 1 1/4" O.D. and operates as a single pass unit.

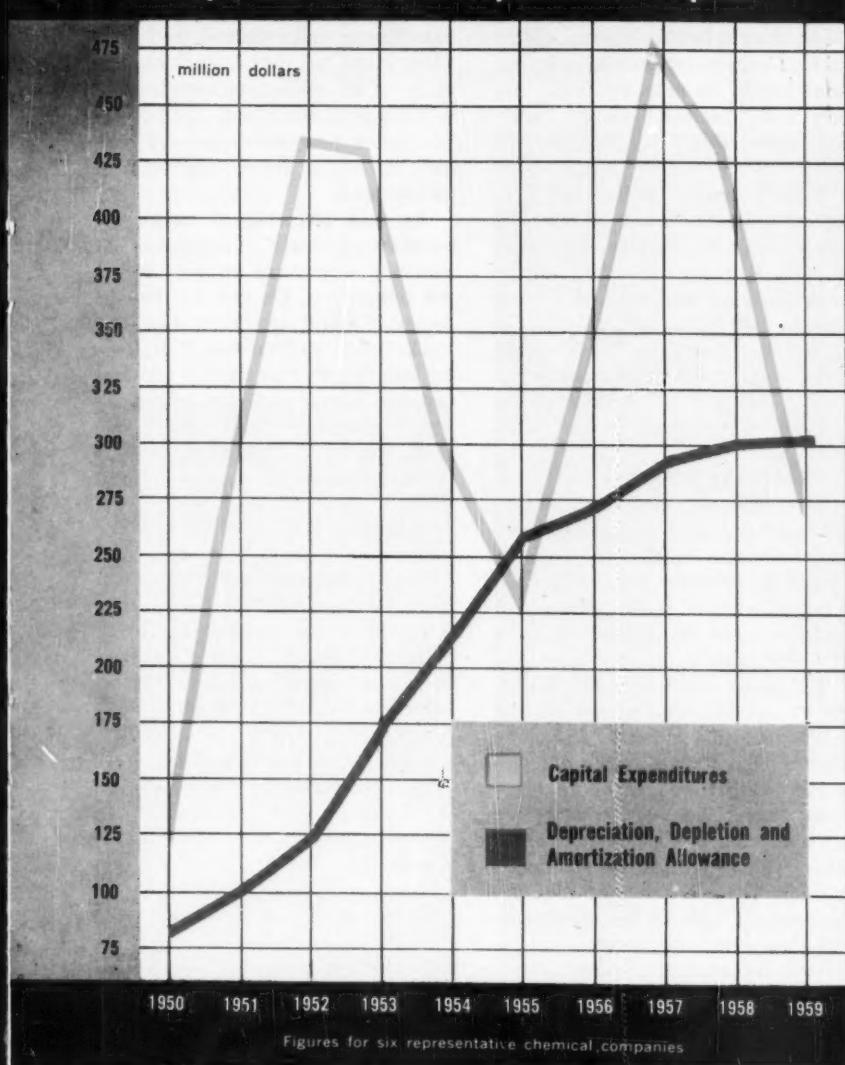
10 "Karbate" Series 240A Heat Exchangers cool an organic slurry containing HCl.

"National", "Union Carbide", "N" and Shield Device
and "Karbate" are registered trade-marks for products of

NATIONAL CARBON COMPANY



The Ups and Downs of Replacement Capital



Chemists' Assn. says it does not find a serious or immediate need for developing a solid industry viewpoint. However, committee discussions are on the MCA agenda for early next year. And MCA tells *CHEMICAL WEEK* that it is now reviewing CPI depreciation problems in the light of Treasury's survey but has not yet formed any definite policy.

The graph (*left*)—although representing only a small sampling—indicates the basic depreciation situation in the CPI: an unrealistic relationship between depreciation and capital expenditures. This relationship holds true, generally, for all CPI companies, but gains severity as company size increases.

That depreciation is a greater problem with the larger companies is borne out by the fact that 80% of the depreciation dollars are claimed by a very small number of large companies. Of the nation's 900,000 corporations, only 150,000 use accelerated depreciation methods, and just 500 of these account for 50% of the amount of depreciation dollars claimed.

Although the depreciation problem thus seems to be concentrated among industry giants, most businessmen are willing to give up capital gains treatment of depreciable property sales in return for "a more adequate depreciation system." Basis of this judgment is a 1,000-firm sampling of the Research Institute of America's 30,000 members. RIA used the Treasury Dept.'s questionnaire (*CW, Dec. 10, p. 52*), sent it to all members, and is still expanding its count.

The cross-section of businessmen shows, as CPI executives have said for years that liberalized depreciation allowances would spur capital expenditures. Most RIA member firms prefer giving to each company the freedom to set its own schedule of years for depreciating plants and facilities, keeping such a system on a consistent basis.

Recent Developments: Such a plan allows more latitude than the current measure, The Revenue Act of '54. Although this significantly liberalized allowances, no one was really satisfied with its provisions. The liberalization was seen as a step in the right direction, but not as a long-run

Better Write-offs Coming?

With only a few weeks left before Congress returns to work, chemical industry management is waiting to see if and how the new Administration will fulfill its campaign promise of more liberal depreciation allowances.

Consensus is that Congress is ready to ease the depreciation strictures; but in industry, and presumably in Congress, there's a big difference of opinion over how the job should be done.

This difference is particularly clear in the chemical process industries,

which are still unable to agree on a single course of action.

This disagreement is sure to be apparent to Congress, as it is in the Treasury Dept.'s unprecedented survey of industry depreciation practices and preferences. The findings, along with the department's own recommendations, will be made available to the lawmakers.

No Problem? Because write-off practices and problems are so highly individual in the CPI, Manufacturing

ADMINISTRATION

solution to the problem of adjusting the tax laws to the swift pace of obsolescence.

Since '54, efforts for more basic reform have been pressed from two directions:

(1) Academic economists and spokesmen for business have joined forces in numerous Congressional hearings to argue for a change. They repeatedly point out that U.S. depreciation regulations are "the most backward in the world."

(2) The Eisenhower Administration has sought ways to liberalize present regulations by administrative edict.

But neither of these efforts has brought results.

Most of the Administration's efforts have centered around Bulletin F, the "bible" of the revenue agent when it comes to approving or disapproving the useful life of depreciable property. Instructions to revenue agents to relax the regulations within reasonable limits have produced no appreciable results. Out-and-out revisions of the regulations were blocked by Treasury officials or abandoned.

Chemical processors, particularly, have come to grief over Bulletin F. For most industries, the limits within which accountants should work are spelled out. Not so for the CPI, which gets no ground rules, instead merely has a list of arbitrary life expectancies for hundreds of individual items.

The Canadian System: If changes are effected, some form of the Canadian "bracket system" seems likely; at least, such alterations are apparently in the minds of present Treasury officials. This would mean that all depreciable property would be grouped into separate and broad classes (the Canadian plan has 17 categories). Depreciation rates are assigned to each class and these rates are applied across-the-board to everything that is in the class.

"Each rate is set high enough to encourage expansion and replacement," according to the American Economic Foundation, which has studied the problem. "No attempt is made to assign a useful life to any particular machine or other assets." The allowances under the Canadian system are in many cases six or seven times greater than similar U.S. allowances.

According to leading economists, the Canadian experience sustains the conclusion that liberalization of de-

preciation allowances does not impair revenues. Rather, it actually stimulates capital expansion and investment and even increases the revenue.

What to Expect: Could the Treasury Dept. order a bracket system without asking Congress for permissive legislation? Legally, it probably could. But only a bull-headed Treasury leadership would make the effort, in the opinion of old Treasury hands.

Nobody knows whether the Kennedy Administration will continue the policy line of the Eisenhower Administration. Kennedy speaks favorably of more liberal depreciation as a stimulus to economic growth. But he adds that any new regulations should make certain that benefits thus allowed would actually result in increased investment and not simply result in a tax windfall.

An easy way out of this problem is to grant markedly more liberal deductions in the case of new investments, adopting some modification of the United Kingdom system. Under this plan, an investor in new plants and equipment can be allowed up to a 44% deduction in the first year.

Whichever of these systems is chosen as a model, say economists, the result would aid industry. A leading accountant has stated: "The question is not whether we can afford liberalized depreciation, but whether we can afford our present outmoded system, which is stifling economic growth." The new Administration has the question; within a few months the CPI should have the answer.

LEGAL

Penalties Levied: Five chemical companies have been assessed penalties ranging from \$1,250 to \$2,500 each by Circuit Judge E. W. Roller in Milwaukee, Wis., for alleged price fixing in bids for calcium chloride. Allied Chemical Corp. (New York), Dow Chemical Corp. (Midland, Mich.) and Wyandotte Chemical Co. (Wyandotte, Mich.) were assessed \$2,500 each. The \$1,250 penalties were against Pittsburgh Plate Glass Co. and its subsidiary Columbia-Southern Chemical Corp.

Judge Roller made the assessments after the firms signed consent decrees, which restrain them from fixing prices. The consent decrees do not constitute admission of price fixing.

Possible Antitrust Suit: The Justice Dept. has taken over the Federal Trade Commission's investigations of Phillips Petroleum Corp.'s purchases of Union Oil Co. of California stock. Significance: under the law, the Justice Dept. could halt further stock acquisitions—if an antitrust suit were brought—while FTC could not. The two oil companies (and their chemical subsidiaries) are in direct competition in certain areas.

Antitrust law exempts stock purposes aimed "solely" at investment but prohibits acquisitions designed to lessen competition. On Oct. 31, Phillips owned 15% of Union Oil's outstanding stock. Union Oil Chairman R. H. Taylor says that Phillips officials told him last April they were "buying our stock for investment purposes." The Justice Dept. has not decided whether it will bring charges.

LABOR

Runoff Elections: In Florida's phosphate fields, near Lakeland, the Teamsters Union has replaced the International Chemical Workers Union as bargaining agent for some 700 employees at Virginia-Carolina Chemical Co. plants in Polk and Hillsborough counties. The election, which produced 348 votes for the Teamsters, 273 for no union, was a runoff following a tie last August when ICWU was ousted.

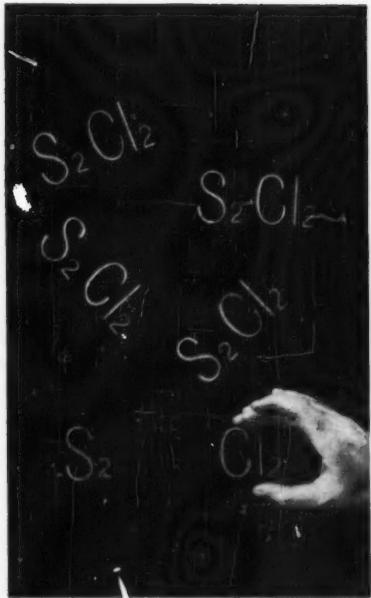
And at Baytown, Tex., the Oil, Chemical & Atomic Workers Union, Local 4-333, won out in an election over the independent Baytown Employees Federation by a vote of 1,394 to 1,145. OCAW broke a deadlock that resulted from a previous election.

New UMW Status: United Mine Workers, District 50, has called a special convention to adopt a constitution and bylaws that will legally establish District 50 as an independent union.

The convention to be held in Washington, D.C., near the end of February, has been called to comply with the '59 Landrum-Griffin labor law. Up to now District 50 has been considered simply a branch of the parent union; it's holding the convention to meet legal requirements that unions hold conventions at least once every five years. Delegates will be asked to decide the process for election of officers—either by convention vote or by refer-

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purity-protected carbonate of potash
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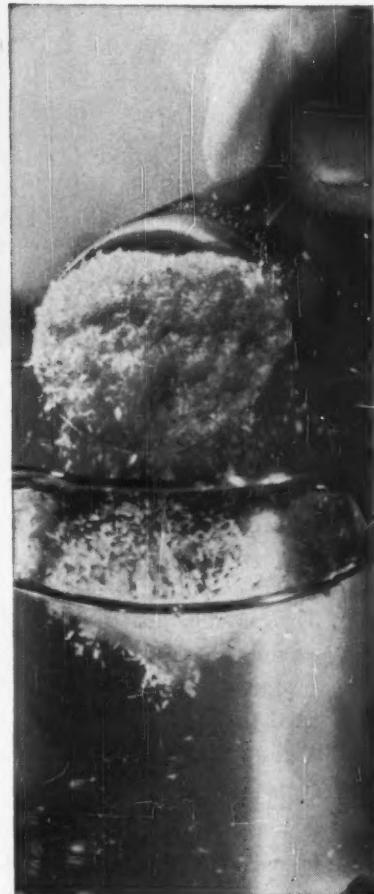
If you'd like a sodium benzoate that dissolves faster than the powdered form, you might consider a switch to Hooker flakes.

As you see here, this flake form starts dissolving as soon as it hits the water.

Thanks to an unusually careful flaking-screening operation, the Hooker flake stands shipping well and won't dust.

It comes in two grades: U.S.P. grade is over 99% pure, contains a max. of 0.2% benzoic acid, 0.5% water. Technical grade is also a high-quality material at 98% purity, with 0.4% benzoic acid max., and the rest water.

You can get either grade in powder form, too. For data sheet, check the coupon.



For more information, check here and mail with your name, title and company address.

Sulfur Monochloride Data Sheet Technical Bulletin 328-B,
Hooker Chlorinating Agents Carbonate of Potash Data Sheet
 Sodium Benzoate Data Sheet

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MISSISSIPPI LIME COMPANY

ALTON, ILLINOIS



ADMINISTRATION

endum among the membership. Until now District 50 officers have served by appointment of the UMW international executive board. The catch-all union, which represents construction, chemical, industrial and a variety of other workers, is headed by A. D. Lewis, brother of ex-UMW President John L. Lewis. It's expected to continue affiliation with UMW.

Texas Inroad: The first inroad by nationally organized labor along famed Chemical Row at Orange, Tex., was achieved by the recent election of OCAW as bargaining agent for employees of Crown Zellerbach Corp. Although a number of elections have been held at plants there over recent years, workers have consistently voted against national organization. Other chemical makers on chemical row include Allied Chemical, Spencer Chemical, Du Pont and Firestone Tire & Rubber Co.

KEY CHANGES

J. D. Mahoney to president, Mobay Chemical Co. (Pittsburgh).

Earle M. Jorgensen to board of directors, American Potash & Chemical Corp. (Los Angeles).

C. J. Allen and **W. H. Morris** to board of directors, Sinclair Oil Corp. (New York).

Nelson Morris II to president, Darling & Co. (Chicago).

Julius Fleischmann to board of directors, Texstar Corp. (San Antonio, Tex.).

Stanley Eysman to president, Cellofilm Industries, Inc. (Wood-Ridge, N. J.).

James D. Willson to financial vice-president, Tidewater Oil Co. (Los Angeles).

Abbott Bray to vice-president, sales, Edco Chemical Co. (Columbia, S.C.).

J. J. Laputka to financial vice-president, Air Products, Inc. (Allentown, Pa.).

A. O. Zoss to vice-president, manufacturing and research, Photek, Inc., newly formed subsidiary, Textron, Inc. (Kingston, R.I.).

Frederick W. Moyer to treasurer, B. F. Goodrich Co. (Akron, O.).

Corrosion can't hide in this fluid end!

You can easily detect corrosive action *before* breakdown with this Goulds Fig. 3715 centrifugal chemical pump.

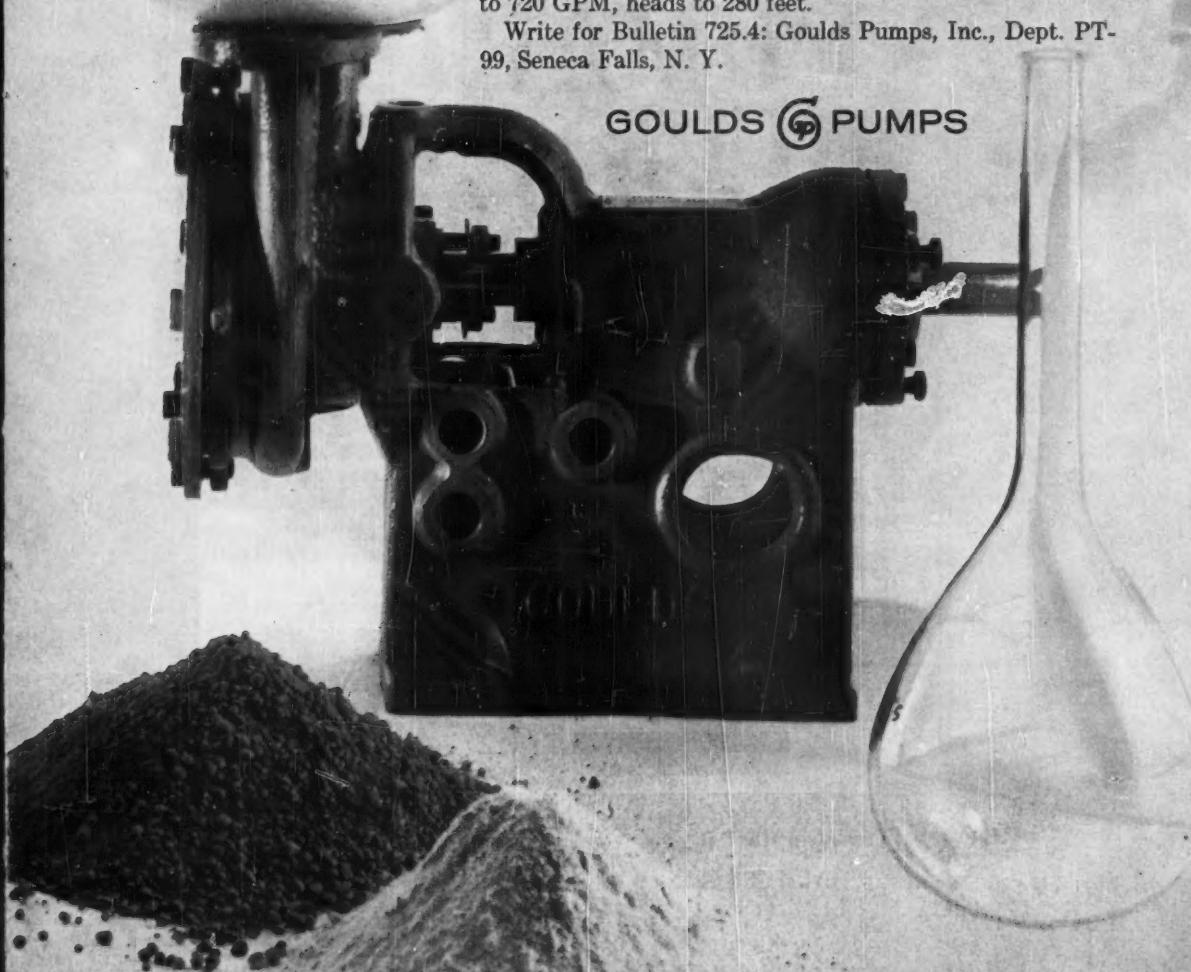
Turn a few bolts and off comes the casing cover. Then you can inspect the impeller and clean out the insides *without disturbing pipe connections*. A millwright can do the entire job alone.

Mechanical seal or stuffing box is subjected to suction pressure only, reducing the sealing problem to a minimum.

The 3715 handles a wide range of corrosive liquids. It is available from stock in Type CF-8M (316) stainless, Goulds-alloy 20, all-iron, aluminum bronze, bronze-fitted or iron with stainless trim. Ten sizes. Temperatures to 350 F. Capacities to 720 GPM, heads to 280 feet.

Write for Bulletin 725.4: Goulds Pumps, Inc., Dept. PT-99, Seneca Falls, N. Y.

GOULDS  PUMPS



Brut



BZURA



CW PHOTOS—M. SCHREIBER

Sniff of sample scent helps customer make his decision. Most gift perfume purchasers are men.

Sweet-Smelling Chemical Market

Christmas shoppers will spend a record \$65 million for perfumes and colognes, about half the total spent in the U.S. this year for fragrances. Sharing in the profits—and helping make possible this boom—is the chemical industry, which supplies aromatic chemicals, alcohol, aerosol propellants, a variety of packaging materials, and the basic perfumery research.

It's an industry dating back to Cleopatra's time (since 1850 in the U.S.). But the changes of recent years outbalance those of any other period in fragrance history. Some have resulted from the changing U.S. market patterns in general—need for new products, consumer panel testing of new products before they are merchandised, altered distribution outlets—but others, like the increasing dependence of marketers on their raw-materials suppliers, are peculiar to this industry.

The Sales Picture: In '60, the per-

fume industry's sales are estimated at \$134 million—12% above '59's \$120 million. Of this total, only one-third will be spent for concentrated perfume. Cologne and toilet water (two names used interchangeably for alcohol-diluted fragrances) will account for the bulk of sales and show the greatest growth.

In recent years, aerosol packaging has boosted cologne sales. In '59, aerosol colognes totaled \$46 million, while sales of conventional liquids were \$34 million and those of stick colognes, \$4 million. Aerosols have made their greatest gains in colognes—some 75-80% of the brands on the market are in spray or liquid form. Although aerosols are making headway in perfumes, only about 15% of the well-known fragrances are now aerosol-packaged.

France continues to dominate the imported-fragrance market and sends to the U.S. about \$3.5 million/year

of the total \$4 million worth of imports. Foreign shippers to the U.S. must pay three separate duties on finished (bottled and sealed) fragrances: an 18 1/4% tariff on the price of the item; 20¢/lb. on the weight of the shipment; and \$10.50/gal. of alcohol.

To get around these tariffs, French houses such as Coty import some of their raw materials, finish the formulation here. Others manufacture their perfumes in France but make colognes in the U.S. (All aerosols are made here.)

Although the U.S. is not generally thought of as an exporter of fragrances, we shipped \$1.2 million worth in '59.

French Accent: There are about 85 major U.S. manufacturers of perfume and cologne, many of them French-controlled. The amount of autonomy varies, as some are merely foreign sales offices while others are



Prospective buyer's wariness . . .



Changes to expression of delight.



wholly owned subsidiaries with a great deal of independence.

To further confuse the picture a number of U.S. companies have adopted French names in order to take advantage of the prestige that French houses command in the eyes of the consumer.

Among the foreign companies, Lanvin Parfums, Inc., and Chanel, Inc., are the biggest in sales. The largest domestic company is Avon Products, a direct-selling firm with sales far outstripping any other fragrance house, foreign or domestic.

19th Century Start: The modern perfume industry and the companies in it today date from the early 1800s. In France some of the first were Houbigant, Roger and Gallet, and D'Orsay; in the U.S., Du Barry (Hudnut) and Daggett & Ramsdell.

In the late 19th and early 20th centuries, perfume manufacturers maintained their own research facilities and created their own fragrances. Today this is rarer, for the creative process is no longer a simple matter and chemistry keeps pushing "art" further into the background. The number of raw materials available has multiplied tremendously and costly instruments are now necessary for analysis. It is, in fact, economically impossible for most perfume houses to have their own facilities.

Also, the last few decades have seen the entrance of the French couturiers—e.g., Dior, Carven—into the business to supplement their fashion lines. This type of marketer was not equipped to set up extensive research facilities.

The Real Creators: The role of creators of new fragrances, of researchers into basic perfume materials, and developers of new compounds has fallen to the aromatic chemical companies. Of the 100 or so names in the field—with industry sales of \$125 million/year—over half the business is centered in the 20 biggest firms. Oldest U.S. company is Dodge & Olcott. International Flavors and Fragrances, Givaudan-Delawanna, Fritzsche and Firmenich are the other big firms.

From the laboratories of these aromatics companies comes a constant stream of new chemicals. Ernest Shifman, vice-president of IFF, estimates that as many as 20,000 aro-

matics have been developed over the past 50 years and that the average perfumer (usually a chemist) may choose from over 3,000 perfume components he's familiar with.

Development of synthetics—those found in nature as well as the new ones—have given the perfume industry steady and unlimited quantities of raw materials, ability to lower prices and make perfume available to a mass market, and to manufacture a better product.

Today, an average perfume may contain 50-100 different compounds and subcompounds, and use of 300 materials would not be unusual. Although use of synthetics is gradually overshadowing natural oils, no purely synthetic product has yet been developed. Many natural oils, such as jasmin absolute, impart a richness that perfume chemists have not been able to duplicate.

Changes in Popularity: Fashions in perfume change periodically, much as do clothing styles. Although it is sometimes difficult to assign a scent to any one class, the industry generally goes along with this breakdown to classify fragrances: fruity, floral bouquet, single floral, oriental, forest, spicy, and modern blend (aldehydic).

Modern-blend perfumes, in which chemicals are so important—Arpege, Chanel No. 5—continue to be best sellers. However, industry observers, aware that these blends have lost some of their novelty, look for another swing of the pendulum. Some expect the trend to go toward light floral scents, or to more "woody" perfumes.

Revolution by Chemistry: The heavy reliance of perfumery on chemistry started in the latter part of the 19th century. Early advances such as the development of ionones and aldehydes made possible perfumes as we know them today. In 1927, Firmenich came up with Exaltolide, a macrocyclic musk, which made fragrances more lasting.

During World War II, perfume research came to a standstill but picked up considerably afterward. New chemicals such as styrallyl acetate were used in massive doses, giving perfumes a punch they lacked and enabling the perfumer to make elaborate formulations.

Educating the Consumer: If the

Cocktails, personal attention help clinch perfume sales.



Christian Dior

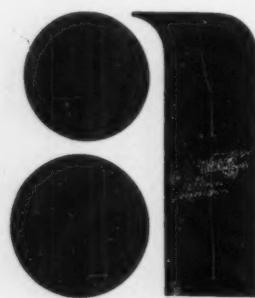
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PROPERTY DATA

CHEMICAL FORMULA . . . CH_3Cl
MOLECULAR WEIGHT . . . 50.491
SPECIFIC GRAVITY
Liquid—23.7°C/4° . . . 1.00
20°C/4°92
Gas 0°C, 1 atm . . . 1.74
BOILING POINT °C, 760 mm . . . —23.76
°F, 760 mm . . . —10.76
REFRACTIVE INDEX, n^{20}/D
Liquid—23.7°C . . . 1.3712
Gas—25°C . . . 1.000703
SOLUBILITY (in cc.) of Methyl Chloride Gas
in 100 cc. of solvent (20°C, 760 mm)
Water . . . 303
Benzene . . . 4723
Carbon Tetrachloride . . . 3756
Glacial Acetic Acid . . . 3679
Ethanol . . . 3740



ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN • INDUSTRIAL CHEMICALS • REFRIGERATION PRODUCTS • FIRE FIGHTING EQUIPMENT

SPECIALTIES

fragrance market is to grow, marketers must solve a number of self-made problems in consumer education and promotion.

For many years the industry has advertised its products as precious luxuries. As a result, women hoard their perfume, thereby limiting consumption.

Compared with European women, who use more perfume than cologne and apply it oftener, U.S. women, if and when they wear a fragrance, tend toward use of cologne. For every bottle of perfume sold in the U.S., 40 bottles of cologne are sold.

Another problem area: the selling of men's colognes. Although most of the big-name producers also carry a men's line, it is found that men hesitate to wear a fragrance, usually (92% of the time) depend on women to buy these products for them as gifts.

Outlets Shifting: Door-to-door cosmetic companies are now challenging the traditional fragrance outlets—drug and department stores. Probably as much perfume and cologne is now merchandised by direct selling as through either of the other two big outlets.

Variety stores, once carrying lower-priced lines, are upgrading their merchandise, often offer French names. And supermarkets, as yet untapped as fragrance outlets, are expected to be the next target.

The Outlook: Better synthetics now under development will enable the industry to market a purely synthetic fragrance in 10 or 20 years. And there are other changes in sight, too:

- Foreign politics and nationalism will force aromatics companies to seek domestic sources for raw materials. (Firmenich and Glidden are producing aromatics from turpentine now.)
- Aerosols will grow to the point where all fragrances will be available in both conventional and spray packages.
- The marketer, in addition to promoting wider use of fragrances generally, will make concentrated efforts in specialized markets—e.g., men and teen-agers.

All these changes could be turned to advantage, help push the perfume market to the \$200-million/year sales mark.

Aerosol Winner

The U.S. aerosol industry paid tribute to its British cousin last week by awarding grand prize for the best-designed spray package of '60 to Sprayclean Spot Remover, a product of Durazone (Sales) Ltd. (London).

Durazone piled up a number of "firsts" in the annual competition sponsored by the Aerosol Division of the Chemical Specialties Manufacturers Assn. Its Sprayclean was the first foreign entry to win the major award; in addition, the company was the first to take top honors in three classifications. (Sprayclean was judged best in Other Household Products and Foreign Products categories, while Durazone's Dew Air Freshener won the Room Deodorants prize.)

This year's awards, handed out last week at the CSMA's 47th annual meeting at Hollywood, Fla., were picked from 272 entries and covered 15 product categories. Prizes were made on the basis of good design and general sales appeal.

Latecomer to Field: Big in the liquid bleach and disinfectant fields, Durazone got into aerosols as late as '59. However, Geoffrey Keen, Durazone's marketing director, tells *CW* that his company spent seven years preparing for its entry into pressurized packaging.

"We wanted to reach the mass market," he said, explaining that prior to Durazone's products, British aerosols were high priced, and distribution was limited to hardware and drug stores. (Total British aerosol production is expected to reach 50 million units in '60 and make a whopping rise to 100-120 million units in '61.)

"A package design must be simple and good-looking to get the attention of the housewife shopping in a grocery store," says Keen. The company spends a year or more working on a package design, then puts the product through a test market.

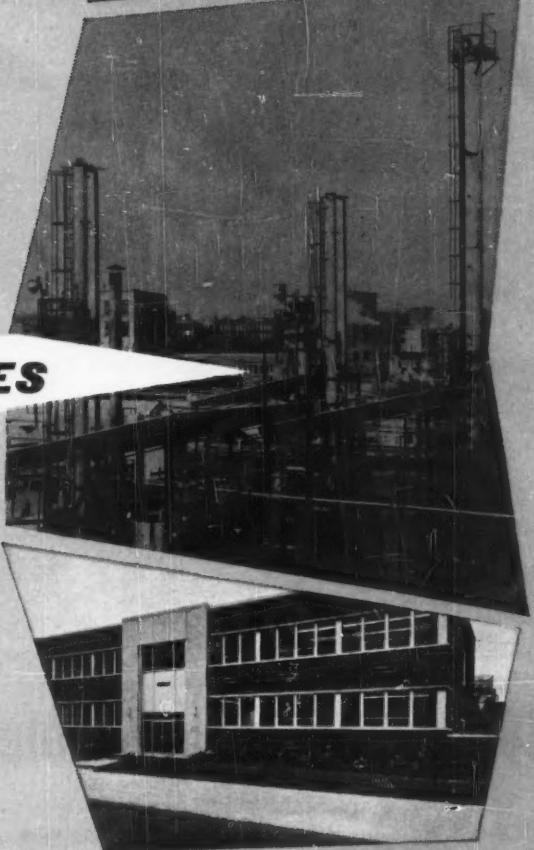
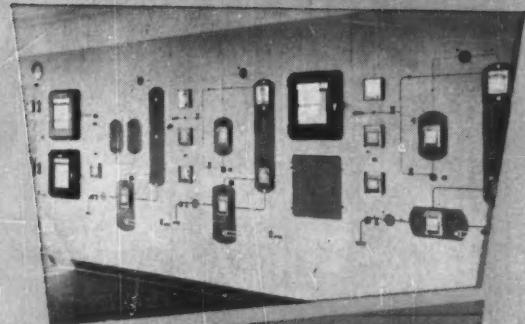
Although it now markets only household products, the company plans to make its first foray into toiletries in February with a hair spray that it promises will be a departure from those currently on the market. Another product enjoying big success in the U.S. and which is now being looked at closely by Durazone is spray starch.

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Technology Newsletter

CHEMICAL WEEK
December 24, 1960

A horizontal fractionating column, called Recumbent Column Rectifier (RCR), will soon be manufactured and marketed by Vulcan-Cincinnati (Cincinnati, O.). The RCR, invented by E. C. Ecky of Ecky Laboratories (Cincinnati), uses rotating impellers moving within fractionation "stages" to provide the vapor-liquid traffic given by the bottom reboiler and overhead condenser in conventional distillation towers. The RCR thus eliminates the large reflux heat load required for conventional distillation. (Equilibrium temperatures are maintained by heating the sides.)

Intended primarily for vacuum fractionations, the RCR claims four advantages: (1) it can do vacuum fractionations normally not possible; (2) it is much shorter—stage efficiencies are about twice the plate efficiencies of conventional towers; (3) it saves on utility costs; (4) it allows cheaper construction wherever a horizontal column can replace a vertical column. Ecky has proved his fractionator on lube oils. Tests show that the capacity is about the same as for conventional columns; consequently, diameters would be equivalent.

A major cut in heat exchange costs for chemical processes may result from acoustical vibration studies now under way at Southwest Research Institute (San Antonio, Tex.). The work, begun under sponsorship of the Office of Saline Water, U.S. Dept. of Interior, to improve heat transfer and raise saline-water conversion efficiency (*CW Technology Newsletter*, May 28), has spread to the chemical process, metallurgical and liquor distilling industries.

SWRI researchers have found that acoustic vibrations can improve the heat transfer coefficients 443% for viscous flows (Reynolds No. 540) and 11% for turbulent flows (Reynolds No. 16,000). Further improvements in the turbulent flow area may be obtained by using larger vibration equipment.

SWRI's director of chemistry and chemical engineering, W. E. Thompson, says the technique may be applicable in any industry where heat and mass transfer are major considerations. For example, good test results have been obtained in improving the heat transfer in steam condensate. And Irwin Raben, manager of chemical engineering, says that the use of acoustical vibrations may greatly reduce scaling on heat transfer surfaces.

A fuel cell that reacts sodium with oxygen and water will be used in a prototype of a Navy power plant to be designed and tested by M. W. Kellogg Co. (New York) under a \$764,000 contract just awarded by the Bureau of Ships. Originally developed at Western Reserve University (*CW*, July 30, p. 28), the sodium-fueled cell develops almost twice the voltage and current density of hydrogen-burning cells, thus allowing

Technology

Newsletter

(Continued)

fewer cells to do the same job. In addition, storage of sodium (handled as an amalgam) is easier than that of hydrogen.

Kellogg, which has completed two previous research programs on the sodium amalgam cell, says that the prototype will develop about 75 kw. and will weigh 2-3 lbs./kwh. of capacity, including fuel storage. Operating cost is pegged at 27¢/kwh., leading Kellogg to note that cheaper fuels, such as liquid or solid hydrocarbons, would be needed for large-scale commercial application.

Electric Storage Battery Co. (Philadelphia)—deep in fuel cell research of its own—will supply the oxygen electrode for the Kellogg-Navy cell.

A bulk flotation process may be the key to beryllium exploitation in one of the largest deposits in the U.S.—in the Mount Washington district of Nevada, south of Ely. Anaconda Co has optioned nearly 2,000 acres of the claim (see p. 22). Since the Mount Washington ores average only about 1% beryllium oxide (compared with 10-12% in domestic ores selling for \$46-48/ton) they will have to be upgraded. The Bureau of Mines process, still not disclosed in detail, brings them to a concentration of 20-22% with recoveries of about 80%.

Asbestos is being mixed with asphalt in a road test strip under construction by Colorado's highway department (Denver). Object: to increase resistance to cracking. Johns-Manville and Clute Corp. are each giving the state 33 tons of asbestos for the experiment. But commercial use of asbestos fiber, if proved feasible, would cost about \$1.50/ton of mixture, about \$733 per mile of road.

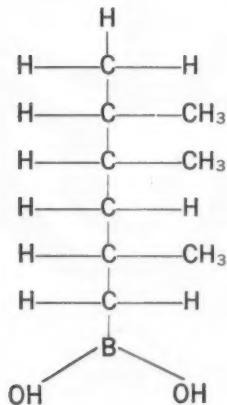
Urethane foam finishing operations may be simplified by use of a newly developed continuous forming machine of Foam-Flex Corp. (New York). The foam, rigid or flexible, is continuously formed between two layers of material such as paper, foil, cardboard, plastic, wood and metal that is fed into the machine in sheets or rolls. The foam adheres to the layers or, if silicone-treated paper is used, can be separated easily from the backing material. Trimming, slitting and laminating of foam made by conventional slab molding is eliminated.

The process, by Collins & Aikman (New York), is covered by U.S. Patent 2,841,205 (additional U.S. and foreign patents are pending). C&A has retained the rights to use the technique with cloth, has given the rights for use with other materials to Foam-Flex. Urethane Systems Engineering Inc. (Willow Grove, Pa.) is making the first three machines under Foam-Flex license for delivery early next year to firms in this country, Australia and Israel. Major uses for the foam: in packaging, sandwich-panel building construction, vibration control. Limiting factors: maximum thickness of the foam is 3 in.; one of the backing materials used in the forming machine must be flexible.

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- Mild bacteriostat and fungistat for polymer systems, cutting oils, paper, glassware, leather, and fibers.
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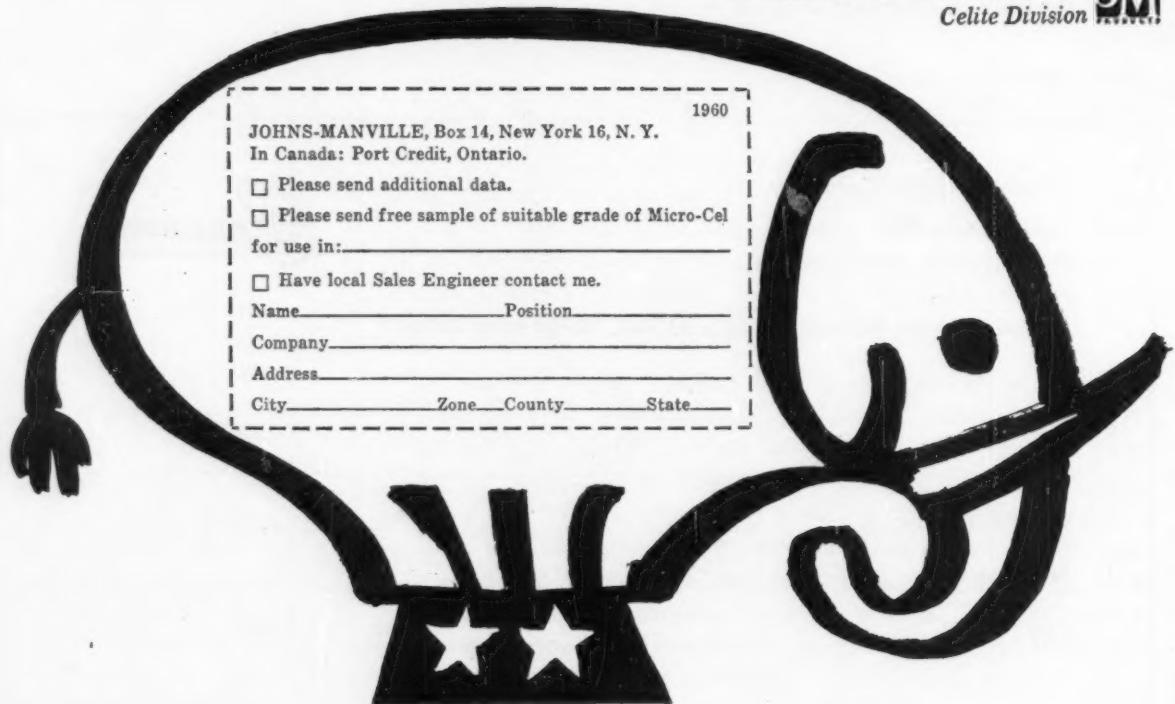
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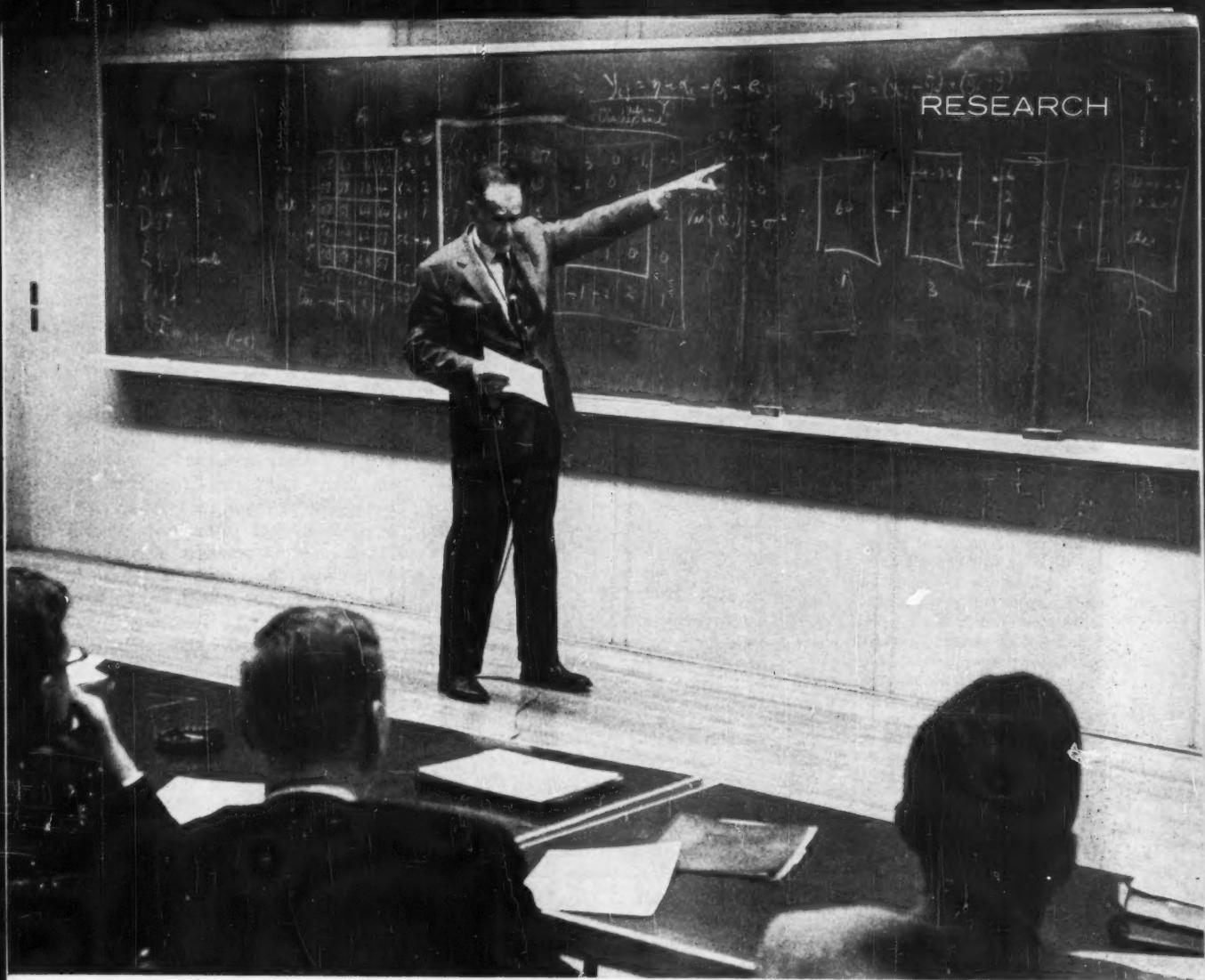
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Consultant Cuthbert Daniel teaches design of experiments to Standard Oil of Indiana researchers.

Lessons in Statistics Hike Research Yields

This week Shawinigan Resins Corp. (Springfield, Mass.) researchers start a new semester in an intramural course—the design and analysis of industrial experiments. Like a growing number of companies, Shawinigan is investing in this type of training in a bid to save research time and labor through statistical education.

And already, many of these companies report, the special courses are paying off.

Among the firms that have set up their own instruction courses, besides Shawinigan, are Standard Oil of Indiana, Sinclair Research Laboratories, Du Pont, American Cyanamid, Interchemical, Jefferson Chemical, and Pennsalt. Others contemplating the move include Nalco (planning a series of training lectures for its research

personnel) and Victor Chemical.

Even those companies that haven't started their own courses are actively encouraging staffers to achieve at least a nodding acquaintance with subjects such as evolutionary operation (*CW*, Oct. 24, '59, p. 75), Box methods (*CW*, March 31, '56, p. 56), confounding, multiple regression, etc.

Many go outside for instructional help. For example, the seven-day program on the design of experiments for the chemical and processing industries at Rochester Institute of Technology has drawn students from American Enka, Chemstrand, Dow, Harshaw, Merck, Rohm & Haas, Union Carbide Chemicals, Wyeth, and many other CPI firms. These companies have been quick to pay the \$175 tuition that includes

text, supplies, luncheons, housing and final banquet.

The program, under the wing of the Educational Committee of the Chemical Division of the American Society of Quality Control, also draws instructors from the CPI—Carborundum Co., Eastman Kodak and Monsanto have provided men.

Design for Profits: Sinclair research associate Robert Smith estimates that a chemist will be three to five times more productive for any given expenditure of money if he uses experimental design than if he doesn't. Or looking at it another way, "You can get information for five projects instead of one for the same expenditure."

Also, it greatly reduces the analytical load, since not as many experi-



RESEARCH

ments are performed. And experimental design provides quicker understanding of a research problem.

Shawinigan's technical director, R. N. Crozier, says, "One of the chief features of designed experimentation is that it demands the mathematically oriented chemist to bring to bear on the problem all pertinent knowledge and experience in order to properly plan his work."

The object of Shawinigan's course is to give the research chemist one more tool to use in his work. Statistics are used to clarify a problem so that the chemist will appreciate the number and magnitude of the errors he will encounter and will be better able to tell which experiments to make.

Fred Wood, section leader at Standard Oil of Indiana, says one aim of experimental design is "to get the most out of the research dollar." It has been particularly helpful, he adds, "in providing data for rating one set of processes over another and in product evaluation." Typically, it has been used to determine the best way of blending components in gasoline to find "synergistic octane blends and to avoid antagonistic blends." It has been used in research on oxidation polymers, alkylation, isomerization, catalytic reforming and cracking, lubricating oil and grease additives, etc., but Standard isn't giving details.

A. C. Walker, head of the statistical group at International Minerals & Chemical, feels that experimental design will never "supersede" bench work, but he does expect it to make continuing gains as a tool in helping to decide "what measurements to make" and in evaluating bench-work results. Two projects at IMC in which the technique is especially useful, in Walker's opinion: (1) evaluation of the relationship of various levels of nitrogen to sugar beet varieties and their yields; (2) determination of the efficiencies of fertilizer mixes on Florida pine trees.

Battelle Memorial Institute notes that "research in science and engineering is increasingly dependent upon advanced mathematical methods," that the need for proficiency in mathematics is increasing. Battelle's research staff includes a group working only on mathematical and statistical analysis of research problems.

Shawinigan had the problem of

determining the critical factors in producing a uniform viscosity in a material to be used as a release coating. For apparently inexplicable reasons, different viscosities were obtained at different times. A statistical study pinpointed the cause of the variation, which was then eliminated.

Shawinigan's Crozier points out that although the new course devotes considerable time to the necessary operational techniques in experimental design, it equally stresses the fact that the misuse or a perfunctory use of these techniques can lead to trouble. Also, statistics is only one of a number of mathematical techniques used in research. Depending on the goals, these other mathematical methods can be utilized.

Limits: Shawinigan's Norbert MacDonald, who teaches the company's course, is convinced that the benefits that accrue from the use of statistical methods in the chemical field will be limited largely to applications and process research. It does not lend itself to basic research.

Says MacDonald, "Whenever a problem gives rise to data subject to experimental errors comparable to the magnitude of effects to be assessed, statistical methods offer the only sound means of obtaining clear and unambiguous conclusions. In addition, whenever theoretical considerations cannot predict results due to the existence of opposing tendencies of unknown contributions, an empirical statistical approach is indicated."

On the other hand, he reasons, in fundamental work, the researcher has few of the facts that would be necessary for a statistical study.

Another company cautions that complete dependence on statistics can lead to missed opportunities. This firm has used "star patterns," a type of minimum-point programming (MPP), in which the object is to pinpoint all the variables worth considering.

Suppose a reaction is sensitive to temperature, pressure and time. The star pattern starts with the area of intensive investigation already defined. These conditions are plotted at the center of the "star." The remainder of the plot is determined from scattered experiments taken at widely different conditions. This can be a great timesaver in pinning down the number of experiments necessary to determine optimum conditions for the

An important technical bulletin has been prepared on this subject, based on actual plant operations developed over a period of many years. It describes basic methods and procedures in detail and shows how significant advantages are now being realized in the preparation of oil-in-water and water-in-oil emulsions through the use of Morehouse Mills and Cowles Dissolvers.

In both types of operations these advantages include— Faster processing of larger batches with thorough distribution of components • Greater volume-per-hour than other equipment • Full control of quality and tints • Important savings in space, operating and maintenance costs • Greater versatility—ability to handle practically any type of material in practically any viscosity range—Dry Pigments, Pulp Colors, Soluble Resins, Dispersible Pastes and Emulsions • Ease of cleaning—rapid change-over without contamination.

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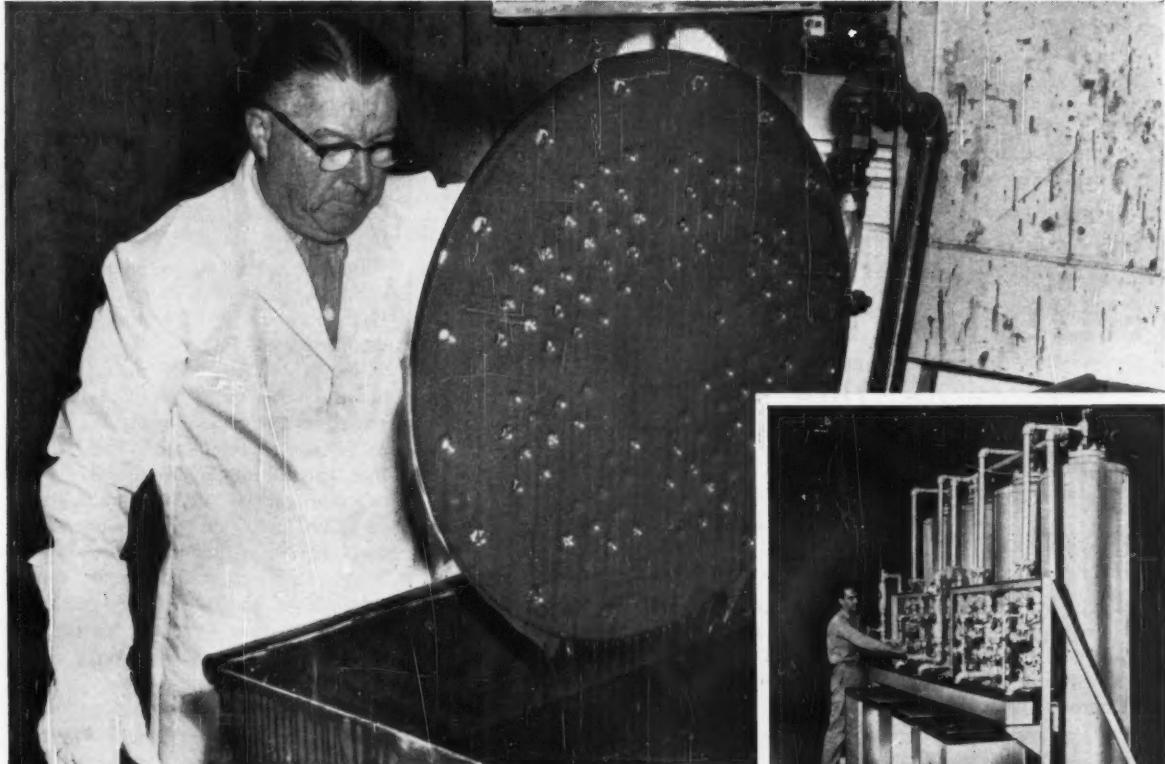
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News about

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Barnstead Still & Sterilizer Company, Forest Hills, Mass., uses Geon coatings in demineralizer parts like the one shown here. Vinyl formulations, called Chem-o-sol®, are made using Geon by Chemical Products Corporation, East Providence, R.I. B.F.Goodrich Chemical Company provides the Geon vinyl.

Single dip of Geon plastisol insures corrosion-free demineralizer parts

Here's a real corrosion problem: the parts of a water demineralizer must never be exposed to the acid and alkali solutions used for regeneration of water. Such exposure would not only corrode and eventually cripple equipment, it would also allow entry of metallic contamination into pure water supply.

The solution is a simple dipping of pre-heated parts into a tank of plastisol made with Geon vinyl, followed by baking. The result is a thick,

tough, corrosion-resistant shell which can withstand abrasion and shock.

The same manufacturer finds that using Geon for slush molding of demineralizer cartridges produces an excellent corrosion-free product. He reports that the plastisol is easy to work with, easy to mold and bake in his own equipment.

Here's a good example of ways Geon can improve your product. For more information, write Dept. GH-9, B.F.Goodrich Chemical Company,

3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

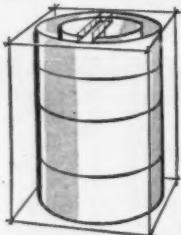


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"PACKAGED UNITS" SOLVE PLANT WATER TREATMENT AND SEWAGE PROBLEMS



The trend to dispersal of industrial plants and the location of new factories in previously undeveloped areas often involves problems of water treatment and sewage disposal. Even when plants have been long established, the same problems may arise as existing facilities become inadequate or conditions change in the surrounding area.

A ready solution is found in the new "packaged" treatment units now available from Dorr-Oliver. Essentially, these offer all the advantages of conventional, large scale systems in a compact, easily installed form suitable for individual plant installations. Basic equipment for each unit is all designed into a single tank. This "unitized" approach not only produces simple, easily maintained units, but also results in relatively low cost.

The Dorrcos PeriFilter System, for example, combines a pre-treatment mechanism and a rapid sand filter to provide a continuous supply of purified water. Depending on the pre-treatment method used, the unit will remove hardness, turbidity, color and/or iron and manganese. Operation can be manual, semi-automatic or fully automatic.

The Dorr-Oliver CompleTreator is a complete sewage treatment unit, operating on the modern Biofiltration principle. In a single welded steel tank, it combines processes that normally would require five tanks. It is so compact that it can be shipped complete by rail or truck, yet has a treatment capacity for 150 population equivalent. Where greater capacity is required, two or more units can be readily installed, or consideration may be given to other Dorr-Oliver equipment.

The development of treatment plants for water, sewage and industrial wastes has long been a Dorr-Oliver specialty. If you'd like to learn more about such equipment, with particular application to your own special problems, just drop a line to Dorr-Oliver Incorporated, Stamford, Connecticut.

Dorr-Oliver offers a wide range of equipment, methods and complete systems for the processing industries. Examples include:

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RESEARCH

reaction. But it can be misleading, too, if the ideal conditions required don't fall within the pattern.

Computers Help: Once researchers master statistics as a tool, the next step is to enlist computers for tedious calculations. The International Business Machines office in Hammond, Ind., has been running a series of seminars on "engineering and research computers applications." This has attracted 30-40 students at each session, with companies such as Inland Steel, U.S. Steel, Union Carbide, Armour Pharmaceutical, and Sherwin-Williams sending staffers.

Standard Oil of California now boasts one of the newest and fastest electronic computers available. It is a \$4-million solid-state IBM 7090 that whips through 229,000 additions or subtractions, 39,500 multiplications, or 32,700 divisions in one second. H. W. Crandall, manager of Standard's electronic computer center, says that the 7090 will be used to "greatly expand" projects currently under way in research, planning and operations simulation.

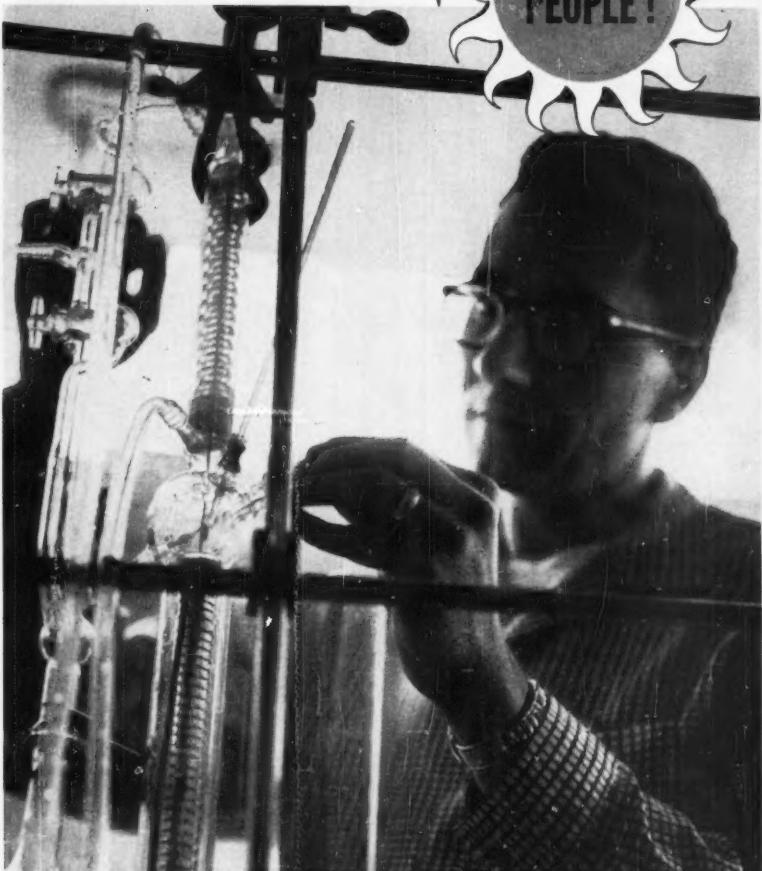
Typical Course: Shawinigan's course is eight weeks old, has eight more to go. Classes meet once a week for one and one-half hours (4 p.m. to 5:30 p.m.). It is open to research chemists and chemical engineers who have a background in statistical analysis. But it is limited to 15 persons so that each may get individual attention.

Early this year Standard Oil of Indiana set up a course in experimental design for all interested technical staffers at the Whiting, Ind., research and engineering center. Of some 500 eligible "students," nearly 200 elected to take the course. There are two lectures a month by New York consultant Cuthbert Daniel and four problem sessions led by Standard personnel.

Upgrading Tool: No one doubts that statistical design of experiments will enjoy increasing popularity at the expense of strictly empirical research. While it will never supplant bench work—in fact it doesn't apply to some research projects—the statistical approach helps make good chemists better, boosts morale by speeding the solution of problems, and shaves manpower needs. Company-sponsored instruction in the technique should, in the opinion of most observers, also be slated for growth.

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RESEARCH

New Optical Masers

The third firm to develop optical masers is International Business Machines Corp. (New York). Its units are the first, however, to provide a continuous (rather than a pulsed) beam of light.

Both Hughes Research Laboratories (*CW Technology Newsletter*, July 16) and Bell Laboratories (*CW*, Oct. 15, p. 110) made their optical masers of synthetic ruby, which generates "coherent" light but only in short pulses. IBM, using new materials, can produce a continuous beam of coherent light, enlarging each device's possible applications in space communications, chemical process control, data processing and other areas. In addition, the IBM devices require only about 0.2% of the power needed by the ruby optical maser.

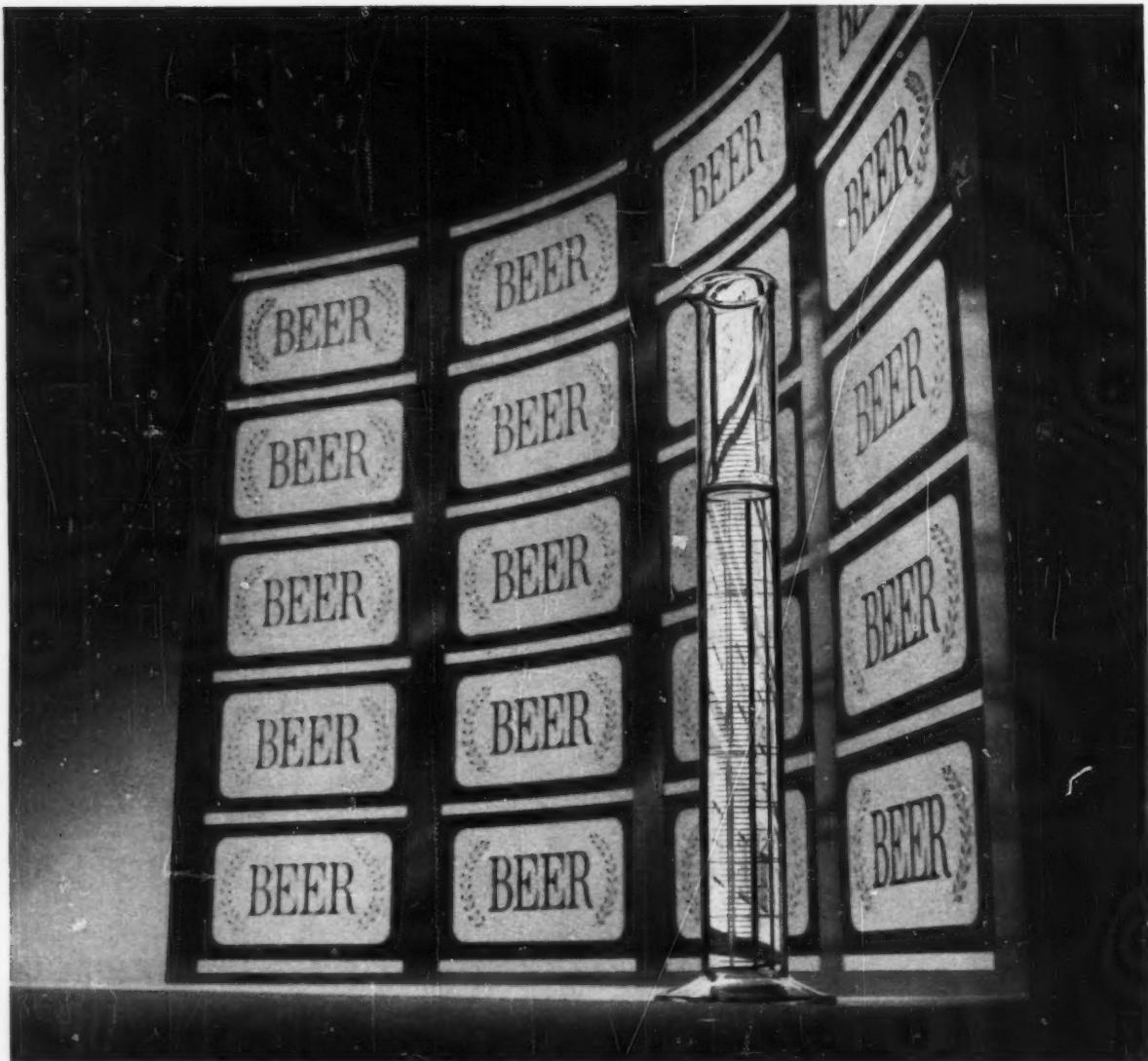
Key to the maser is in the two new materials that have been successfully used by IBM. Calcium fluoride with 0.1% of the calcium ions replaced by trivalent uranium ions emits a wave in the infrared range (2.5 microns), while red light (0.708 microns) is produced by a similar material using divalent samarium ions to replace the calcium. Both devices require cooling by liquid helium.

Californium in Action

Newly developed techniques for working with particles in the submicrogram range are credited with permitting the preparation of the first pure compounds of californium (element 98). The work was reported last week by Glenn Seaborg, chancellor of the University of California, and was performed by Burris Cunningham and James Wallmann of the university's Lawrence Radiation Laboratory (Livermore).

High-temperature reaction with hydrogen chloride and steam gave three identifiable compounds of the man-made element: trichloride, oxychloride and oxide. Samples used in the reaction weighed about one 10-millionth of a gram.

Californium and berkelium (element 97) were first isolated in "visible" quantities two years ago, and a high-flux reactor now under construction at Oak Ridge, Tenn., is expected to produce milligram quantities of californium by '65.



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of the UNITOL ACD vehicle to be equal or better to comparable cotton seed acid resins and greatly superior to comparable soya acid resins. In addition, a 25% replacement of cocoanut oil with UNITOL ACD resulted in panels with color characteristics essentially equivalent to those formulated with 100% cocoanut oil, while the Sward hardness of the film increased as well.

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CHEMICAL PRODUCTS DIVISION

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Market Newsletter

CHEMICAL WEEK
December 24, 1960

Prices of sulfur are firming up after more than four years of deterioration. Last week Pan American Sulphur Co. lifted tabs on both dark and bright sulfur by \$2/ton. New prices, f.o.b. Coatzacoalcos, Mex.; dark sulfur, \$22.50/ton; bright sulfur, \$23.50/ton. In addition, Tampa, Fla., tabs will be increased \$2/ton, f.o.b. trucks or railroad cars, at the company's Tampa terminal. The latter applies to both dry bulk and liquid material.

The adjusted prices will affect new customers immediately. Prices on business under contract will be applied as current contracts permit.

U.S. producers were still evaluating the situation, but it appears that they will also hike prices. Freeport Sulphur Co. indicates that the new Mexican prices are more in line with its posted prices (*CW Market Newsletter*, Aug. 29, '59), but that the company will give consideration to revising its allowances to meet the new competitive situation.

Vinyl chloride prices are being changed again. Solvay Process Division of Allied Chemical is dropping prices from 11.3¢/lb., f.o.b. Perkins, W. Va., freight allowed, to 8.91¢/lb., f.o.b. Perkins, freight equalized (tags are for tank-car quantities). In October, Solvay initiated the lower freight-allowed tabs (*CW Market Newsletter*, Oct. 22).

Two Airco liquid oxygen, nitrogen, argon units are reportedly about ready to go onstream. A 25-tons/day unit at Baton Rouge, La., is said to be slated for full production about the first of next year, and another 25-tons/day plant at Tampa, Fla., is expected to be in operation around the middle of January.

Cyclohexane facilities have been completed at Continental Oil Co.'s Ponca City, Okla., refinery, according to the firm's senior vice-president, Harold G. Osborn. The \$1-million petrochemical plant will have a capacity of 20 million gal./year. Conoco has already started production of cyclohexane, which is used primarily as a raw material in nylon manufacture. Among other industrial applications: use as a solvent and as a chemical intermediate.

The new unit will receive hydrogen from the firm's catalytic reformers at the adjacent refinery, which will be used to convert benzene into cyclohexane.

Two facilities to obtain chemicals from pulp and paper operations have been brought onstream by Crown Zellerbach Corp. at Bogalusa, La. The new plants will be able to turn out 10 million lbs./year of dimethyl sulfide, 5 million lbs./year of dimethyl sulfoxide, and 1 million lbs./year of methyl mercaptan.

Market Newsletter

(Continued)

Black liquor obtained from the kraft recovery system of the company's pulp and paper mill adjacent to the plants is used as raw material for the process. A portion of the lignin in the black liquor is converted into dimethyl sulfide, oxidation of which produces dimethyl sulfoxide.

The Bogalusa chemical facilities also produce about 1,700 gal./day of sulfate turpentine and about 300 tons/day of tall oil.

The West Coast ammonia price situation will remain unchanged in first-quarter '61 (*CW Market Newsletter, Sept. 24*). Producers have failed to notify customers of any price increase. Some West Coast ammonia producers expressed hope that higher tabs would go into effect in '61.

Molten sulfur handling popped into the news again last week as Freeport Sulphur Co. revealed a \$23-million expansion of its liquid sulfur terminal and shipping facilities. Freeport will enlarge its Port Sulphur, La., shipping facilities to handle upward of 1.5 million tons of the material. The firm is also adding new terminals along inland waterways and the Atlantic seaboard. It will ship molten sulfur to Atlantic coast terminals in a T-2 tanker it is now converting, the *S.S. Louisiana Sulphur*.

Later next month Texas Gulf Sulphur Co. will begin shipments of molten sulfur in its just-converted T-2, the *Marine Sulphur Queen*, reportedly the first deep-sea vessel outfitted solely for liquid sulfur transport.

Demand for boron, bromine and barites in '60 is down, according to preliminary figures just released by the Bureau of Mines. An estimated 617,900 short tons of boron minerals and compounds will be sold or used in '60 (equivalent to 313,000 s.t. of B_2O_3), compared with 619,946 s.t. turned out last year (314,286 s.t. of B_2O_3). In terms of dollars, however, the industry fared a little better, with '60 output valued at \$46,405,000 vs. \$46,150,000 reported last year.

Sales this year of bromine will total about 177 million lbs. (which represents 210 million lbs., gross weight, of bromine and bromine compounds). This is an 11% decline from '59's sales of 195,483,000 lbs. (231,438,000 lbs., gross weight, of bromine and bromine compounds). Total sales dollars were also off: about \$46 million this year vs. the '59 total of \$51,508,000.

Barites output in '60 is estimated at 726,000 s.t., compared with 901,815 s.t. turned out in '59. Dollar value is also down: from '59's total of \$10,300,860 to \$8,532,000 this year.

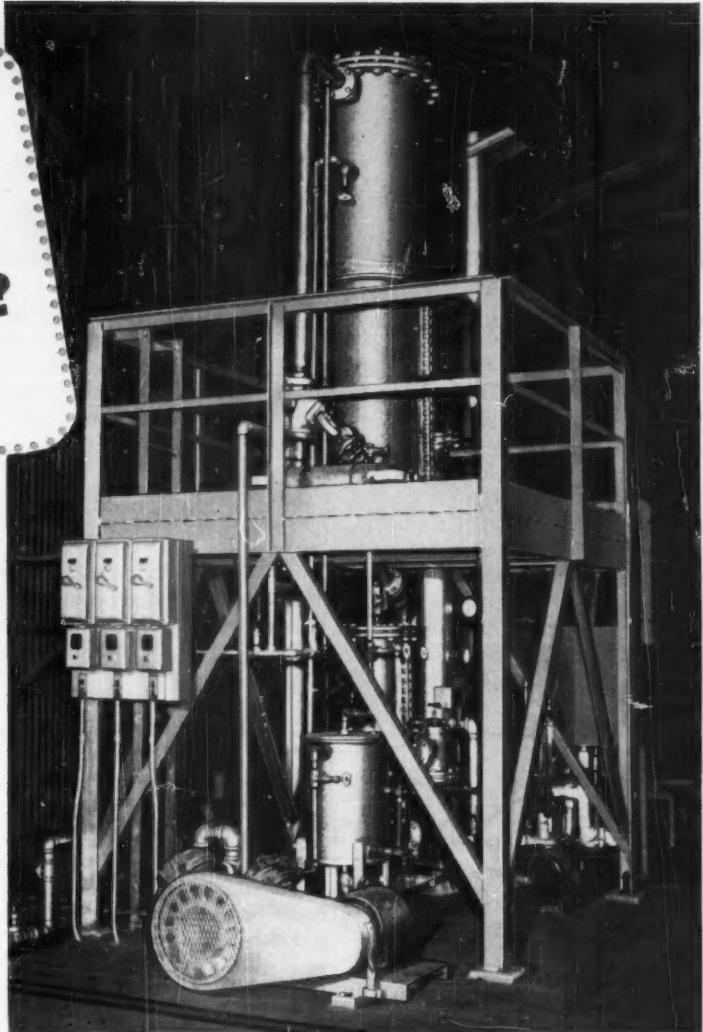
But magnesium will show a good gain in '60. Production in the year is expected to total 39,630 short tons, an increase of 28% over '59.

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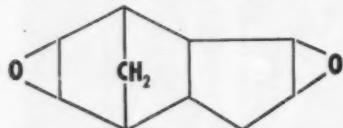
Progress Report...

—New UNOX Diepoxides
—Morpholine

New UNOX diepoxides for plastics

Many plastics producers are finding UNOX Epoxide 207 (dicyclopentadiene dioxide) an exciting new resin intermediate. With its compact molecular structure, UNOX 207 looks especially promising for high-temperature resins, glass fiber laminates, abrasive wheel and brake lining binders and adhesives, and encapsulating materials.

UNOX 207 is a white crystalline powder, and its structure looks like this . . .



The epoxy groups on UNOX Epoxide 207 are most reactive under acidic conditions. UNOX 207 cures rapidly with many common, low-cost hardeners to form plastics with high heat distortion temperatures. Illustrating this, test bars made with UNOX Epoxide 207, maleic anhydride, and trimethylol propane, retained a heat distortion temperature in the 300° C. range, even after aging for 400 hours at 260° C. Glass fiber laminates made from a system based on UNOX 207 were aged 192 hours at 500° F. and still had a flexural strength of 22,000 psi.

Diepoxide hardener systems have a long pot life at room temperature, but can be cured rapidly at higher temperatures. A good resin formulation for evaluation use is:

1.0 mole dicyclopentadiene dioxide
.8 mole maleic anhydride
.13 mole trimethylol propane

After being warmed slightly, then allowed to cool to 30° C., the resin has a viscosity of 100 cps. and a pot life of longer than a week. The mixture can be cured in a few minutes by raising its temperature to 130-140° C. For ultimate high heat distortion properties a high-temperature post-cure is recommended.

Stable "B" stage resins can be produced in solvent or as a dry powder. After six months on the shelf "B" stage

UNOX 207 resins, prepared by prereacting 40 to 60 per cent of the available carboxyl groups, can be fused under mild pressures and temperatures of 160° C. They will also form up to 70 per cent solutions in acetone-toluene mixtures.

Fillers such as aluminum powder markedly improve impact strength and machineability. For two technical reports, "Resin-Forming Reactions of Epoxide 201" and "High-Temperature Epoxy Resins" or technical information sheets on UNOX Epoxides 206 and 207, please mail the coupon.

Water-resistant rubless floor polishes

When the kids play Lord Nelson in the family tub, and the rain outside has a way of tracking itself indoors—waxed floors become the target for spotting and marring.



The problem facing the floor polish formulator is to develop a polish that is resistant to water-spotting, and that can be removed easily when the floors are washed.

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with no serious change in the emulsion. In fact, an excess of morpholine even provides freeze-thaw stability.

Polishes based on morpholine form bright, even, wear-resistant films on linoleum, mastic, hardwood, and other floor surfaces.

To find out how you can take advantage of the properties of morpholine, check the coupon below for a copy of the paper "Performance of Morpholine in Floor Polish—Rate of Development of Water Resistance."

Tear out this coupon. Check the boxes on which you'd like more information, and mail to Dept. H, Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y.

Resin-Forming Reactions
 High-Temperature Epoxy Resins
 UNOX Epoxide 206 and 207 technical sheets
 Performance of Morpholine

Name _____

Position _____

Company _____

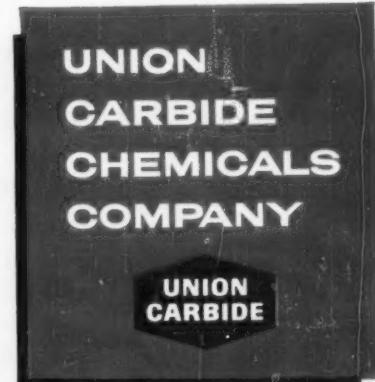
Street _____

City _____ Zone _____

State _____

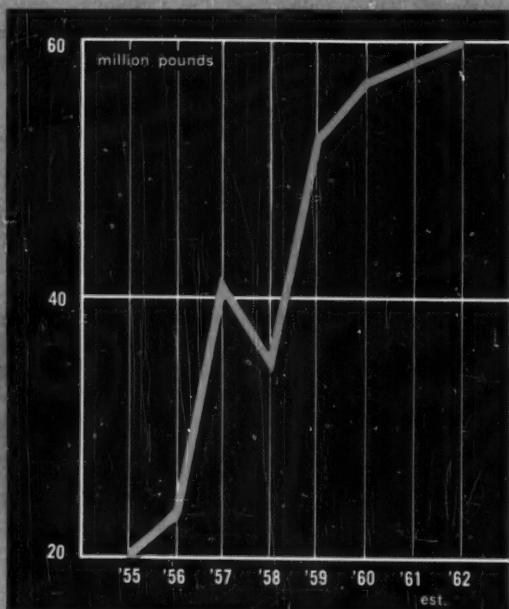
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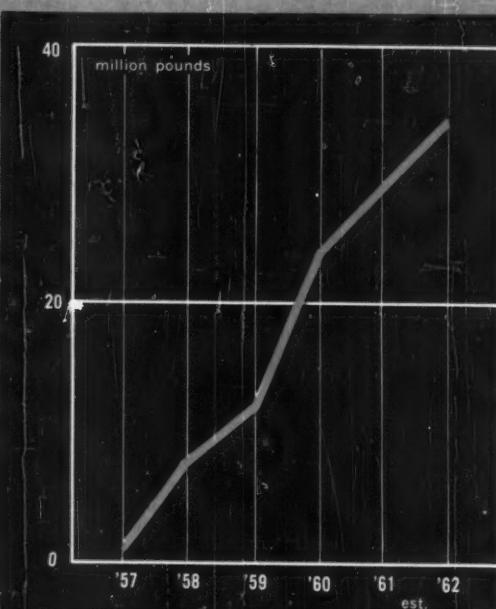


MARKETS

Trichloroethylene imports level off



Perchloroethylene imports climb



Importers Push for Bigger 'Perchlor' Sales

After carving out gains in the domestic market for the past five years, trichloroethylene imports will level off in the years ahead (see chart above). But in the meantime, importers of solvents intend to push hard for increased sales of perchloroethylene. Imports of perchloroethylene this year were double those of '59; and a 50% increase over the '60 mark is expected by '62.

The major importers explained to *CW* this week that although they could increase trichloroethylene sales substantially during the next few years, they've decided to maintain their present share of the market—about 14%. It is unwise, they say, to take more than 15% of the total domestic market. Reason: a more serious price war than the existing one might result if they push for increased trichloroethylene sales. This not only would generate further ill will among domestic producers but also would adversely affect their over-all business and profits.

U.S. producers of solvents are wary but admit that prospects for a leveling off of trichloroethylene imports are good. To be on the safe side, however, domestic producers are improv-

ing their production techniques to meet the possible challenge of further foreign penetration. Last week, for example, Du Pont revealed plans to close its Wyandotte, Mich., plant by Jan. 31, '61, and to consolidate all of its trichloroethylene production at Niagara Falls, N.Y. The major reason: to allow Du Pont, with an improved production process to be installed at Niagara Falls, to compete more effectively against lower price imports.

Trichlor Gains: Actually, trichloroethylene imports have been plaguing U.S. producers since '50, when 2.5 million lbs. came into this country. During the subsequent five years foreign trichloroethylene gained a 20-million-lbs. market in the U.S.

However, it was not until after '55 that imports of this chemical began to really move in, make a serious impact on sales of the domestically produced material. For example, in '57 imports jumped to 41 million lbs.; they reached 52 million in '59; and hit a record-breaking 57 million lbs. this year.

U.S. consumption of trichloroethylene is expected to reach 400 million lbs. by the end of this year while pres-

ent production capacity is approximately 485 million lbs. (*CW*, March 26). Plants are being operated at 73% of capacity instead of 83%, which would be the rate if there were no imports.

By '62, over 432 million lbs. will be required to satisfy U.S. demand. But assuming that imports will gain only slightly over present rates by '62, capacity utilization may reach 77% by that year. This may influence some producers to think about new expansion.

Tetrachloroethane, the precursor to trichloroethylene, has a very short import history—3.5 million lbs. in '58, 11.5 million in '59, and 18 million in '60. Most, if not all, of this material was purchased by Du Pont from Edison of Milan under a temporary contractual arrangement. The contract expired in September of this year and, according to Du Pont officials, there are no immediate plans to renew.

Perchlor Problem to Persist: Although relief seems to lie in sight for trichloroethylene marketers, imported perchloroethylene will still be a problem. The marketing plans of two major importers, Chemical Manufacturing Corp. and International Selling

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MARKETS

Corp., will affect the future. One (which asked not to be identified) intends to continue an aggressive sales program during the next year or more. However, both say they do not plan to allow imports to be greater than 15% of the total U.S. consumption in the foreseeable future.

It wasn't until '58 that foreign producers started pushing perchloroethylene sales in the U.S. In that year a total of only 8 million lbs. entered this country; in '59, 12 million; and this year, 24 million.

But more perchloroethylene will be coming into this country during the next two years. In '60 foreign material captured 11% (24 million lbs.) of the total U.S. market. By '62 the importers will be selling at least 34 million lbs. (14% of U.S. consumption).

By '62 approximately 243 million lbs. of perchlor will be used in the U.S., an increase of 38 million lbs. over the present level.

However, with imports supplying a good share of this increase, domestic producers will have little to cheer about. Thus by '62 it's likely that the industry will not be able to raise operating rates much above the present level, 73% of capacity.

Pricing a Problem: U.S. producers of trichlor and perchlor are concerned over the impact of imports on domestic prices. The published price for perchloroethylene is 12½¢/lb. delivered (tank-car quantities). The importers attempt to market their material at ½¢/lb. below domestic price. But this ½¢ differential is reportedly only rarely maintained.

U.S. producers point out that the importers price their material as low as necessary to get the business. In some cases the material is moving at 2¢ to 3¢/lb. below schedule. U.S. producers react differently to this situation in the marketplace; some hold fast to their price schedules while others meet the low bids of importers.

Four European countries have been the major factors in this import situation—Italy, United Kingdom, France and Belgium. However, sizable imports are also coming from Sweden and West Germany. Italy and U.K. have dominated the perchloroethylene scene; France and Belgium have concentrated on perchloroethylene imports. For example, during the past five years Italy and the U.K. alone shipped 60 to 85% of all the trichlor

that arrived at U.S. docks, while Belgium and France exported almost all the foreign perchloroethylene used in the U.S. (about 70%).

Four importers have handled sales of these European-made chemicals—Chemical Manufacturing Corp. for the U.K., Ming Corp. for Italy, International Selling Corp. for France and International Petro Solvents for Belgium, Germany and Sweden.

End-Use Pattern: Metal degreasing is the major end-use for perchloroethylene. This accounts for 90% of the total U.S. consumption during this current year. Degreasing has realized a healthy growth pattern, especially since '54 when neutral-type stabilizers appeared on the scene.

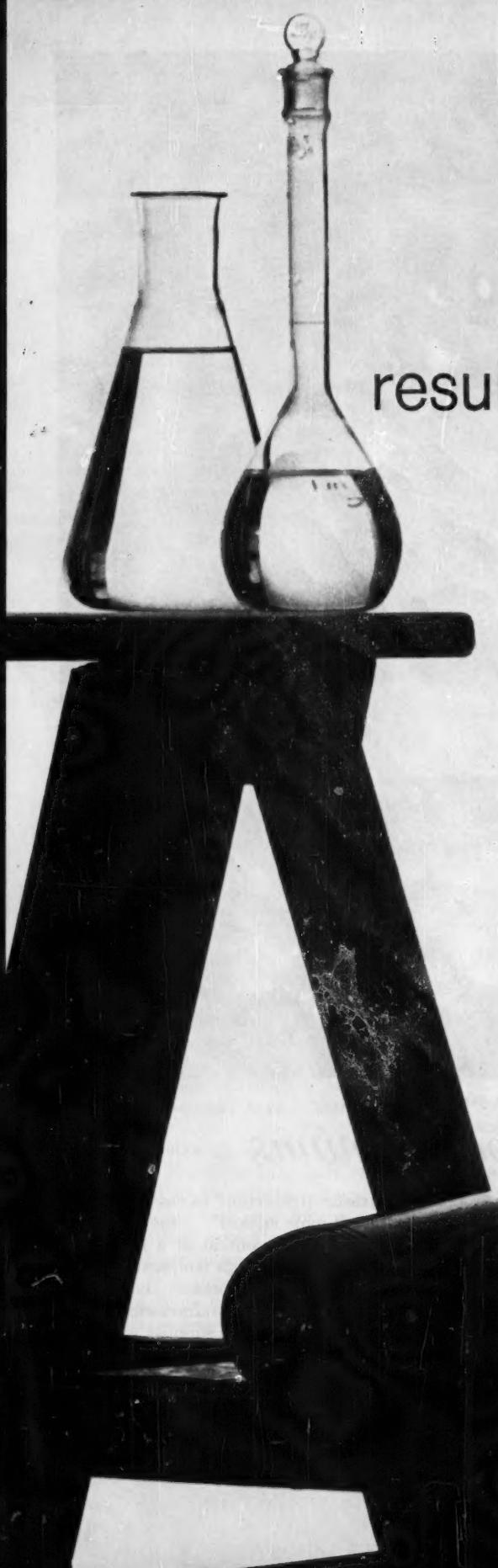
Now two new developments promise to make the metal industry an even more important perchlor consumer in the years ahead: trichlor-based phosphatizing and trichlor-based painting. Both of these processes have been developed by Du Pont and are being actively promoted in the industry.

Drycleaning is the major end-use for perchloroethylene. During '59, 160 million lbs., 78% of total U.S. demand (CW, March 26), went into this outlet. Here its major competition is Stoddard Solvent (an aliphatic petroleum naphtha). Perchloroethylene consumption has been growing in this area much more rapidly than the overall growth of drycleaning services.

New drycleaning establishments such as the Martinizing chain of retail stores with drycleaning facilities on the premises have given impetus to the perchloroethylene growth pattern. Major reason for this move toward perchloroethylene is the general lack of zoning restrictions for drycleaning establishments utilizing perchloroethylene as the cleaning solvent (perchlor is nonflammable).

In addition, self-service-type drycleaning machines utilizing perchlor as the solvent are being introduced and promoted by Norge, RCA and Standard Inc., which should stimulate consumption of perchloroethylene.

Looking Ahead: If importers follow through on their intentions, combined imports of trichloroethylene and perchloroethylene will likely level off in the next two years. This would lead to a period in which both domestic producers and importers would be able to maintain the status of profitable coexistence.



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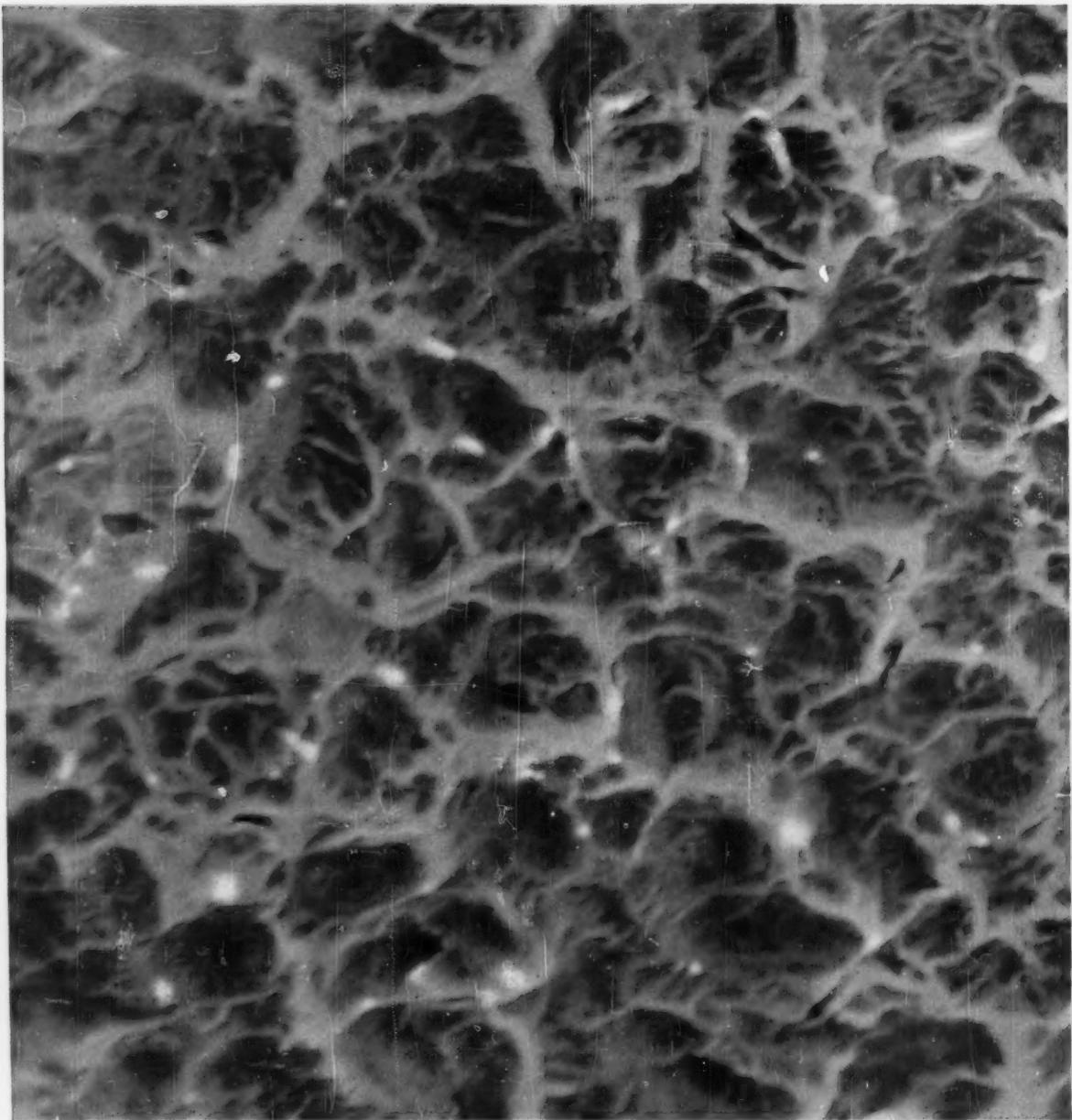
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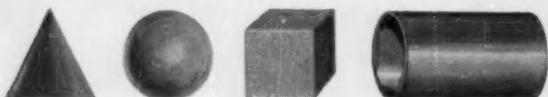
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Chemical Trading Stamps?

Will trading stamps be added to the growing number of sales weapons in the chemical seller's arsenal? It's a serious question; during recent weeks, two trading stamp companies have launched efforts to penetrate chemical markets, and already at least one chemical seller has begun giving stamps to its customers.

Despite its novelty, stamp-promoted selling of industrial chemicals is drawing widespread interest, a *CHEMICAL WEEK* spot-check last week showed, and not much of it is favorable. Although few of those contacted know much about how such plans work, the early consensus is: "Sounds like a bad thing for the industry—a little too much like kickbacks."

How It Started: Just two weeks ago (*CW Market Newsletter*, Dec. 10) a New Jersey firm, Circo Corp. (Rahway)—a combination metal degreasing equipment manufacturer and chlorinated solvents distributor—began giving S&H Green Stamps to purchasers of its imported trichloroethylene. Circo sells nationally, has 14 warehouses across the nation. The company's goal, aside from boosting sales volume, was to reduce credit costs (only prompt payers get the stamps).

The Circo trading stamp plan represents the first use of the sales premiums, widely used in retail selling, in the chemical process industries. Moreover it's the first time that the Sperry & Hutchinson Co. (New York), largest and oldest of the stamp companies, has ventured into an industrial market.

How It Works: Circo offers to give S&H Green Stamps to purchasers of its imported trichloroethylene. Basis: one stamp for each 10¢ purchase. (Solvents sellers view Circo's stamp scheme as an alternative to other forms of price discounts or outright price cuts, figure it may stir an even more intense price war among U.S. trichlor marketers if it catches on. *See also* p. 73.) However, there's one catch, and for Circo it is an important one: to get the stamps, trichlor customers must pay their bills in full within 10 days after invoicing.

Circo has stamped in green ink a re-

minder of its offer on all its trichlor invoices. If the payment is received within the specified time span, the customer's stamps are sent to his accounting department.

Tryout: So far, Circo has decided not to give the stamps to its perchlor customers or buyers of its line of metal degreasing equipment. One exception: Circo is trying to collect its overdue receivables from all its customers by offering them stamps when they pay. This, however, is a one-shot attempt.

Normally, the trading stamps go only to buyers of the company's imported trichloroethylene. Reasons: Circo wants to test the scheme with its trichlor business first, figures there's enough extra margin on the imported material to support the costs of the stamp program.

Wellington Vandever, Circo president, figures his firm can bite off at least 30-35% more of the big trichloroethylene market with the help of stamps. (Circo's trichlor sales now top \$1 million annually, are nearly half the company's total volume.)

And Vandever is counting on the stamps to lure in his accounts receivable in less time. Currently, Circo's customers are averaging 42 days to pay their bills; Vandever hopes to get this figure into the mid-20s.

Circo may get some promotional mileage from its novel trading stamp plan, particularly since it's the first industrial concern to give out the ubiquitous S&H Green Stamp. Already, Circo has launched mailings to its solvents customers, urging them to get in on its "windfall bonus."

Other Stamp Plans: Although Circo was first to hit the CPI with trading stamps, and was first to use S&H stamps industrially, another stamp company, Chicago-based Industrial Gift Stamp Co., was actually the first to use trading stamps in industrial selling situations (*CW*, Oct. 15, p. 28). IGS's purple stamps are given to customers on the basis of one stamp per each 27¢ purchase. Although only steel and plumbing supply distributors have used them so far, IGS expects to approach the chemical industry soon. Reportedly, two chemical



Circo's Vandever: 'Trading stamps could boost "trichlor" sales 30-35%.'



'We figure stamps will help cut our receivables almost in half.'



'Let's not forget that these trading stamps are company property.'



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SALES

firms are considering this scheme.

Critical Reaction: Early reaction to IGS's industrial trading stamp plans has been varied, with the preponderance of it being quite critical. "I'd throw the first man out of my office who proposed such a scheme," was the comment of one Midwest chemical purchasing man to **CHEMICAL WEEK**.

Others have labeled both stamp arrangements as "gimmicks" or kickbacks. Some have even gone so far as to call the stamp plans commercial bribery.

Main Objections: Most criticisms of the industrial stamp plans center on the use of stamps by customer companies. Many chemical purchasing men checked by **CHEMICAL WEEK** feel it's basically dishonest for a salaried P.A. to accept anything from a supplier, particularly when it represents a discount, as trading stamps do.

Circo's answer: chemical purchasing men will not receive the stamps. Instead, they will be sent to the office that paid the bill, which would generally mean to the treasurer's office or to the accounting department. What happens at that point is the customer's business.

Vandeveer also says Circo hopes to stave off any temptation for employees to take company stamps (which are identical to those given at supermarkets) for personal use. It urges wide publicity of the trading stamp idea within customer firms.

Another widely heard criticism: few companies have policies that cover such matters as trading stamps. Most of them would have to set up a system for storing them, pasting them in books, keeping records and redemption. And for what would a large corporation use the trading stamps?

Circo's answer: while most firms do not now have policies that would cover trading stamps, if a company wants to accept them it would not be hard to work out a suitable savings plan. And S&H has a list of worthwhile, special corporate redemption items. Some uses suggested by Circo and S&H:

(1) Gifts to charitable organizations.

(2) Equipment for employees—sporting goods, refrigerators.

(3) Office equipment.

Prospects: Both Circo and Sperry & Hutchinson admit their present scheme is experimental. S&H is working on similar arrangements with

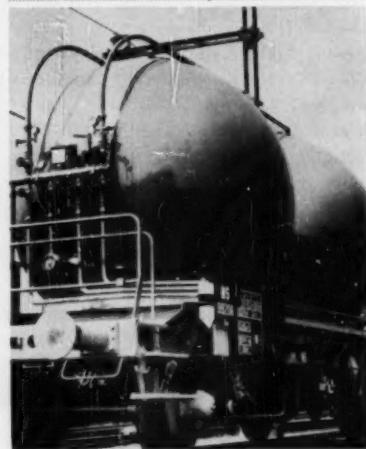
other industrial companies, though it plans to restrict stamp plans to one firm for each chemical commodity.

Neither firm will discuss costs of setting up a stamp plan, but it's understood that S&H gets 1 to 3% of Circo sales under the plan.

So far, S&H has decided against issuing stamps worth more than its standard one (that given for each 10¢ purchase). It doesn't want to "dilute" the powerful identification force of the green stamp by turning out stamps with higher values.

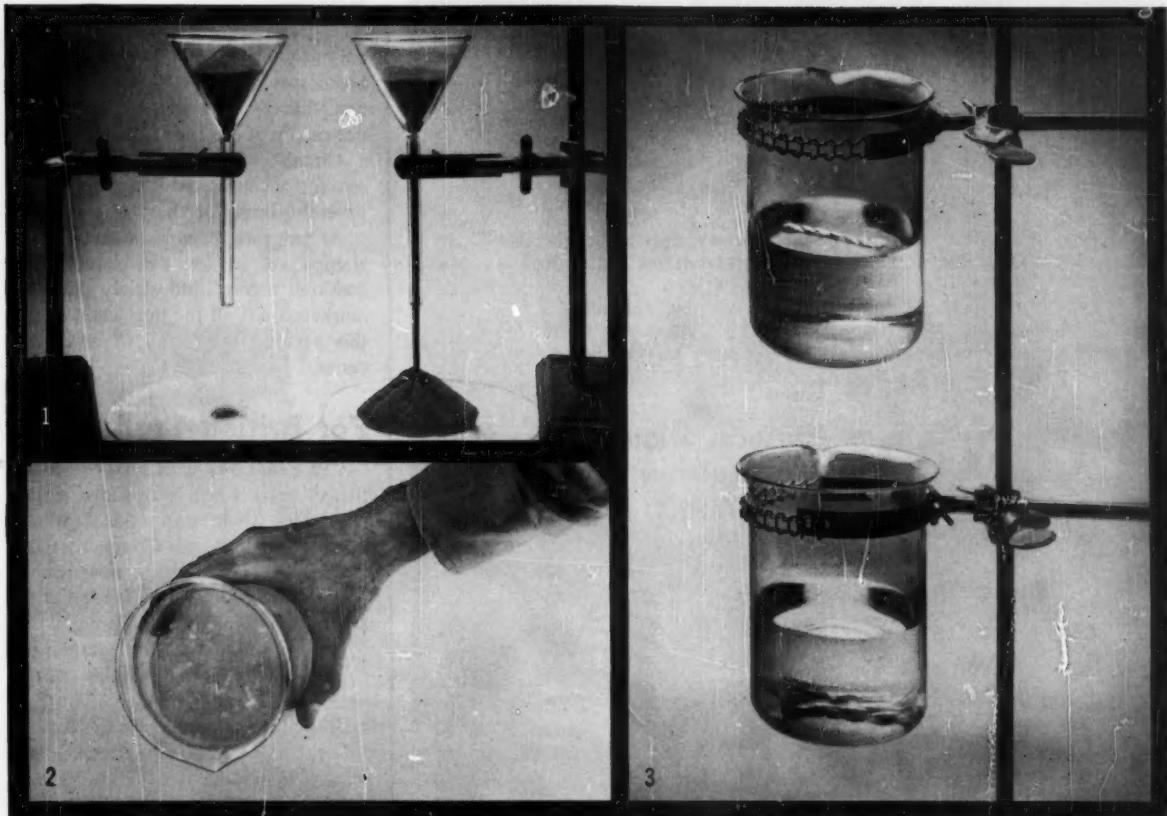
S&H has come out with a larger book, however, for the convenience of industrial stamp savers. The new books will hold 10,000 stamps, compared with 1,200 in the standard consumer book.

Just what lies ahead for trading stamps in the chemical industry is difficult to predict. Most purchasing men believe stamp plans will meet stiff resistance among most medium-size and large chemical producers. Perhaps the best chance for trading stamp acceptance is with the smaller chemi-



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These odd-looking rail cars represent the latest ideas of Netherlands chemical traffic men on how to handle granular or powdered materials such as dry chemicals, plastics, fertilizers, cement. Each car carries two steel spheres with a combined cargo volume of 1,200 cu.ft.—less than one-third the capacity of conventional U.S.-made hopper cars. Carrying capacity: 28 tons; loaded weight: 40 tons. Secret of the spheres: cargoes are handled pneumatically with air pressures up to almost three atmospheres.



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SALES

cal producers and resellers. These businesses are often proprietorships, and the owner may use his stamps personally if he wishes.

Circo's major business is with smaller accounts, which may explain its enthusiasm for the stamp scheme.

At any rate, it appears that trading stamps are in for considerable discussion before industrial chemical marketers sift all the pros and cons of this revolutionary kind of price discount.

For British Trade

CPI producers with an eye on the British market will soon have a new outlet for their promotional wares. The U.S. Dept. of Commerce and Dept. of Agriculture are now rounding out plans for a U.S. Trade Center to open in London next spring.

This will be the first permanent government-sponsored display of its kind abroad, says Commerce. It urges interested manufacturers to consult either the Commerce Dept. field offices or its Office of Trade Promotion, Bureau of Foreign Commerce.

Although company representatives will take orders for goods on display, the center will concentrate on helping U.S. firms find British distributors and survey potential markets.

France on Guard

Despite its booming production and exports, the French chemical industry is worried about foreign competition, especially from U.S. companies.

This was admitted by Maurice Brulfer, president of the Chemical Trade Assn., in a recent speech to French financial writers.

The French consider U.S. companies a threat, according to Brulfer, because their chemical industry is so much smaller than that of the U.S., both in output and in size of individual companies. When the U.S. puts a mere 6% of its production on the international market, its exports are equal in value to half of the French industry's total production, he said. And although French companies devote about the same percentage of their sales to research as do their counterparts in other producing countries, it's hard for even a big French company to keep pace with a U.S. firm whose net profits alone are often

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SALES

as large as the French firm's sales.

For this reason, Brulfer stated, "We cannot consider without reserve and even uneasiness the growing importance of investments by American chemical companies in Europe."

He also indicated that the French chemical industry is not happy about the tendency of U.S. firms to build their own plants in France instead of licensing French companies to use their processes and patents, as they once did.

DATA DIGEST

• **Sulfuric Acid:** New edition of sulfuric acid brochure includes data on uses, manufacture, properties, storage, handling and methods of analysis. General Chemical Division, Allied Chemical Corp. (40 Rector St., New York 6).

• **Converting Starch:** Kit contains brochure and technical bulletin describing dustless, high-density, flash-dried starch for enzyme converting. Industrial Division, Corn Products Sales Co. (10 East 56th St., New York 22).

• **Hygienic Guides:** Five new folders (cost: 25¢ each) outline potential health hazards, standards for allowable exposures, and medical treatment for overexposure to acetonitrile, diethylamine, diethylene triamine, nitropropane and tetrachloroethylene. American Industrial Hygiene Assn. (14125 Prevost, Detroit 27, Mich.).

• **Electroplating:** Bulletin describes 18 electroplating methods, including three new nickel processes. Hanson-Van Winkle-Munning Co. (Church St., Matawan, N.J.).

• **Food Products:** New catalog lists Food & Drug Administration-approved surfactants and emulsifiers for use by the ice cream, baking and food processing industries. Process Chemicals Co. (8733 South Dice Rd., Santa Fe Springs, Calif.).

• **Fatty Acids:** Booklet gives specifications and composition analyses for coconut fatty acids, including caprylic, capric, lauric and myristic, stripped and distilled coco acids and a caprylic-myristic blend. Armour Industrial Chemical Co. (Chicago 6).

• **Ethers:** New, 40-page bulletin lists properties and uses of ethers and glycol diethers. Union Carbide Chemicals Co. (270 Park Ave., New York 17).

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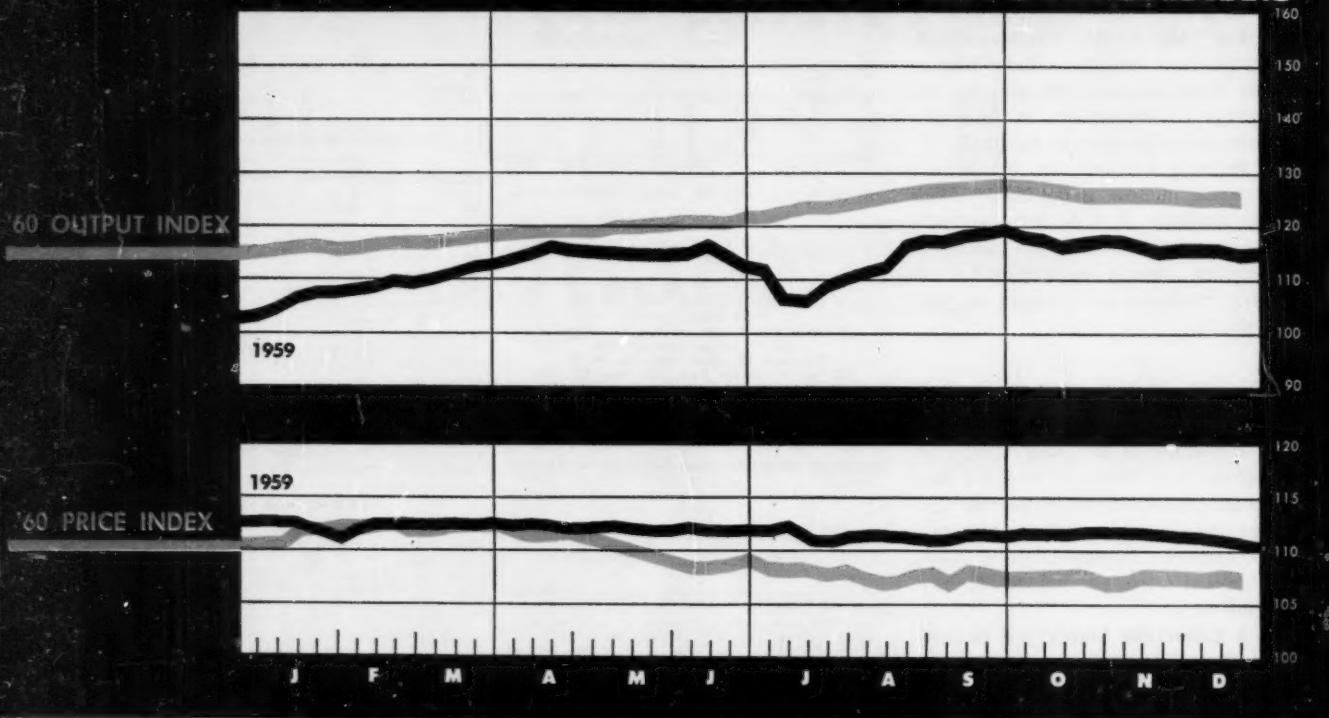
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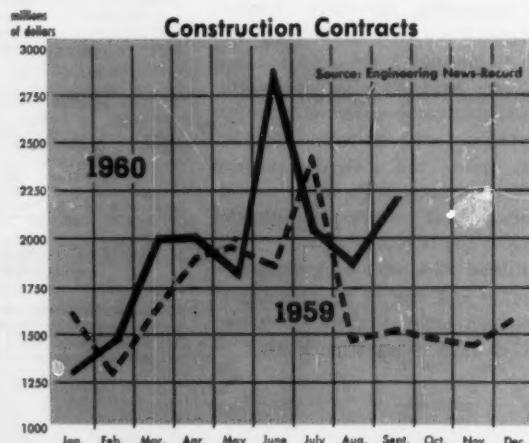
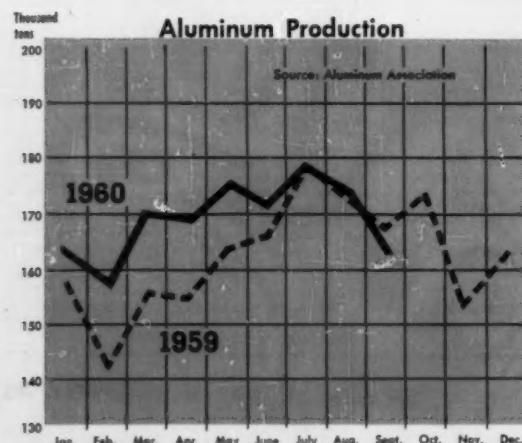
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WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	124.5	124.5	115.9
Chemical Week wholesale price index (1947=100)	106.8	107.4	110.9
Stock price index (12 firms, Standard & Poor's)	46.69	46.08	60.61
Steel ingot output (thousand tons)	1,387	1,396	2,726
Electric power (million kilowatt-hours)	14,604	14,368	14,167
Crude oil and condensate (daily av., thousand bbls.)	7,152	6,984	7,123

TRADE INDICATORS

(million dollars)	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All manufacturing	29,640	30,070	29,384	54,310	54,710	51,515
Chemicals and allied products	2,250	2,300	2,219	4,130	4,160	4,037
Petroleum and coal products	3,210	3,200	3,037	3,260	3,260	3,295
Paper and allied products	1,050	1,090	1,006	1,640	1,640	1,481
Textile products	1,140	1,200	1,197	2,690	2,640	2,536

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Chemical Week

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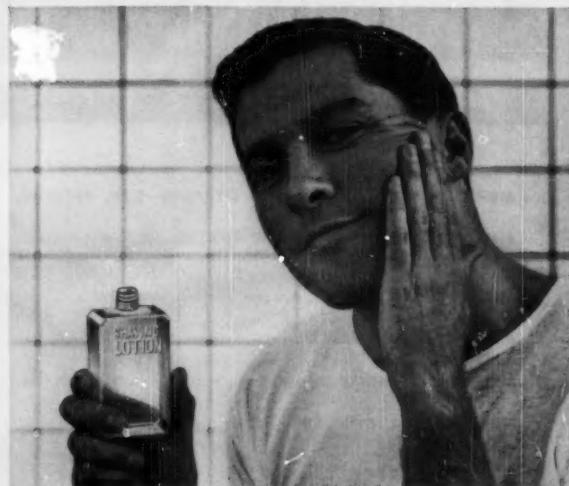
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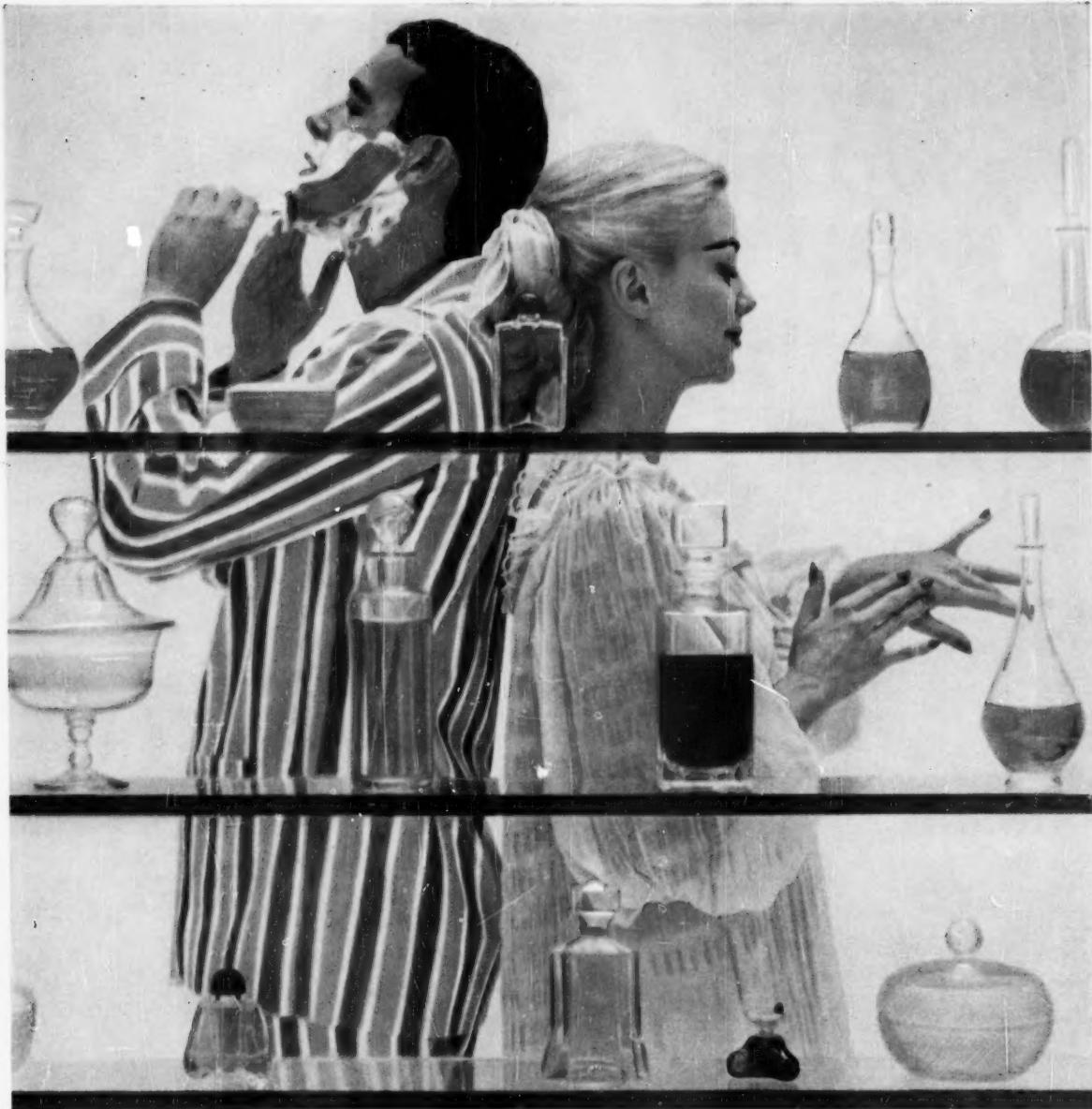


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Miike Gosei Plant to use SD Process

Rheinpreussen Plant to use SD Process

Scientific Design Company, with the addition of new plants in France, Japan and Germany, has designed 16 maleic anhydride plants in 8 countries. These plants now account for two-thirds of the world's capacity.

SD POLYETHYLENE PLANT FOR JAPAN

August 15—Scientific Design Co., Inc., principal licensee of the A. G. für Olefinpolymerisation high pressure polyethylene process concluded a contract authorizing Dow's Swiss subsidiary, Dow Chemie A. G., to use the process in several countries on a non-exclusive basis for the benefit of its manufacturing subsidiaries and associated companies, and exclusively in Japan to Asahi-Dow Ltd.

SD Offers New Route To Fumaric Acid

July 1—Scientific Design's new, simple fumaric acid process can be adapted to any process stream which contains maleic acid. The result of work carried out at SD's Research Center in Little Ferry, N. J., the process employs a special catalyst and is based on moderate isomerization conditions.

Francolor to Use SD Ortho-Xylene Process, Witco's Eastern Phthalic Plant to SD

October 24—Scientific Design will design and construct its first phthalic anhydride plant using ortho-xylene as initial feedstock for Compagnie Francaise des Matieres Colorantes, Villers-St-Paul, France. SD will also design and construct Witco's new 30,000,000 pound per year phthalic anhydride plant using an SD process and catalyst. Witco's 20,000,000 pound per year phthalic plant in Chicago, also designed and built by SD, has been in operation for some time.



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**International Leaders in the Design,
Development and Construction of Chemical Plants**

